Volume 94 Number 3

# STEEL

*For forty-eight Years—IRON TRADE REVIEW*

PRODUCTION • PROCESSING • DISTRIBUTION • USE

# The Week in Perspective

A TIN can is an insignificant bit of metal alongside a modern railroad locomotive, yet last year the manufacture of the former accounted (p.10) for 52 per cent more steel than railroads used for new locomotives, cars, rails, bridges and buildings. An analysis by STEEL shows that manufacture of all types of containers absorbed 12.25 per cent of the total tonnage of steel produced in 1933. . . . Revised figures for the production of steel ingots during 1933 show (p.13) a total of 22,878,571 tons, compared with 13,322,833 tons for 1932; average rate of operation for 1933 was 33.95 per cent, compared with 19.75 per cent in 1932. . . . Steelmaking operations (p.13) last week were little changed.

**Business Past Depression; Public Debt Vexes**

Along the Washington front, the outlook for business is uniformly cheerful, although there are mixed feelings (p.15) on the question of whether or not a pending national debt of 31 billion dollars will prove too staggering a load for taxpayers. The capital appears convinced that a Russo-Japanese war, certainty of which is becoming less doubtful, will mean bulging order books for American equipment builders, especially suppliers of railroad material. . . . The redoubtable General Johnson, chief code overseer, is bringing code authorities for various industries together in February (p.16) for the purpose of more closely relating the various codes and facilitating their functioning. . . .Confirming Washington opinion, first reports for this year show (p. 19) business gaining strength. . . . Codified industries should avoid using NRA as an excuse for raising prices (p.18) beyond a point justified by higher labor costs.

**Public Verdict on New Car Models Awaited**

Attendance at the New York auto show the first day was 112 per cent over the first day of the 1933 show, indicating the interest of the public in the engineering progress which automobile engineers have embodied in new models. Chrysler's "noble experiment" in radical streamlining is conceded as leading the way (p.14) into a new era of body designs, providing public fancy does not prove fickle. . . . Some car builders have standardized (p.25) on molybdenum cast iron with nickel or nickel and chromium contents for cylinder blocks and heads. . . . Alloy cast iron is also being used successfully (p.25) by automobile builders in camshafts and brake drums.

**Jailbirds Find New Prisons Tough To Crack**

From the stone dungeons of medieval days to the clean, well lighted and ventilated penal institutions of today is a long step and one in which steel has figured prominently. Dangers of jailbreaks being what they are, continual refinements have been made in prison steels over the past three decades, culminating (p. 21) in the present development of high-strength "breakproof" alloy steels, provided in both solid and laminated bars, plates and flats, and fully resistant to any tampering with files, drills, blowtorches and the like . . . . Impact test results have been found to give more reliable information (p. 25) on the ability of cast steels to resist shock in service than test results on tensile strength and elongation.

**What's Doing in the Nation's Steel Mills:**

As much as 80 per cent of the energy produced by the drive motor can be lost in the drive of a rolling mill. Principal source of this loss (p. 27) is in bearing friction . . . . Builders of mill equipment are recognizing the advantages of welded steel construction as an economical adjunct to the use of castings and forgings. However, welded construction cannot be used indiscriminately, proper design (p. 24) being an important consideration . . . . A recently completed continuous pickling system installed in the plant of a strip mill in the Middle West uses rubber-lined tanks (p. 29) laid up with brick and acid-resisting cement . . . . Development of rust spots on a lot of turned and ground shafting was discovered to have resulted (p. 26) from tannic acid in the wood floor of a new shipping truck in which the shafting had been placed.

# Tin Can "King for a Day" in Nation's Steel Consumption

CONTAINERS — principally the lowly tin cans used for packing foods and other products—absorbed 52 per cent more steel last year than did the railroads for new cars, locomotives, rails, bridges and buildings.

They took more steel than did the building industry for new structures, and refrigerators, stoves and steel furniture, all combined.

Into their manufacture went over five times more steel than was used for construction of highways and highway bridges, despite all the public financing to stimulate such improvements.

### Near 1929 Peak

In brief, production of containers showed more striking evidence of resisting depression influences than did any other major steel consuming group. The tonnage of steel required by the makers of containers was the merest fraction under that used in 1929; that is, 1,682,998 gross tons in 1933, compared with 1,683,561 in the former year —a difference of 563 tons.

This was one of the surprising features developed by STEEL'S twelfth annual survey of steel distribution in 1933, with figures from the leading producers summarized in the Jan. 1 issue, page 96.

In the list, the container industry with 12.25 per cent of the total tonnage came second to the automotive group, with 20.95 per cent. In 1932 it was third in line; and in 1931, 1930 and 1929, fifth.

By contrast, containers loomed up especially large last year, as automobiles, railroads, building construction, and oil, gas and water industries still were in depression.

This gave a rather grotesque appearance to the ratio of steel for tin cans. For example, it was disclosed that the railroads absorbed for all principal purposes only 1,105,417 tons of the total 13,743,121 tons of finished steel for which distribution was reported to STEEL.

Erection of buildings, and the manufacture of stoves, refrigerators and steel furniture collectively accounted for only 1,672,334 tons. Highways and highway bridges required but 327,420 tons. Topping all these were the 1,682,998 tons for containers. Automobiles and trucks led containers by only 1,196,662 tons.

Nor was this the only direction in which STEEL'S figures revealed sharp contrasts in 1933. For instance, the distribution shows a total of 1,163,956 tons for buildings, including erecting materials, framework, trim, and other miscellaneous products. This shrinkage from the peak years clearly reflected the depression.

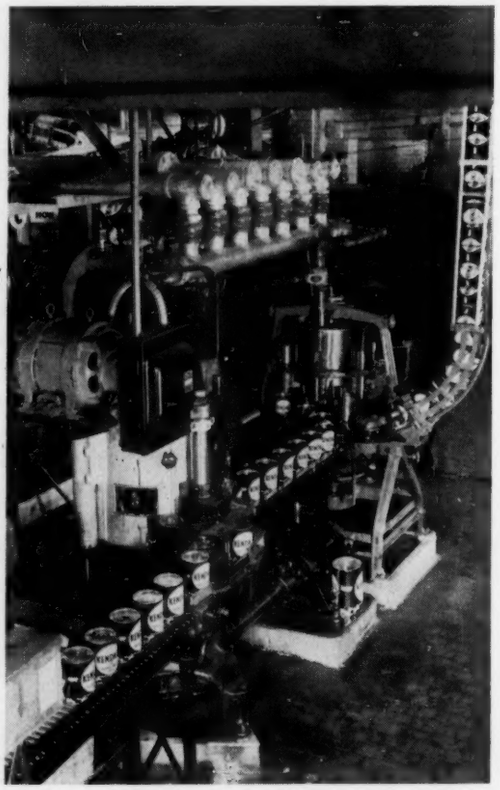
Yet the manufacture of refrigerators, stoves and steel furniture, which generally is assumed to be associated with good times, absorbed 508,378 tons. Through the year makers of refrigerators and stoves enjoyed exceptionally good business resulting from the combination of low prices, and a reserve buying power in the middle classes.

Twelve years ago—as shown by STEEL'S former surveys—production of containers consumed only 753,502 tons. The amount increased substantially each year to 1,567,761 tons in 1926. In the following two years there were slight reductions. In 1929, however, the industry came back strong, with a peak of 1,683,561 tons. Even at the low point in the depression, 1932, consumption for containers was 1,005,091 tons.

### Large Wire Tonnage Used

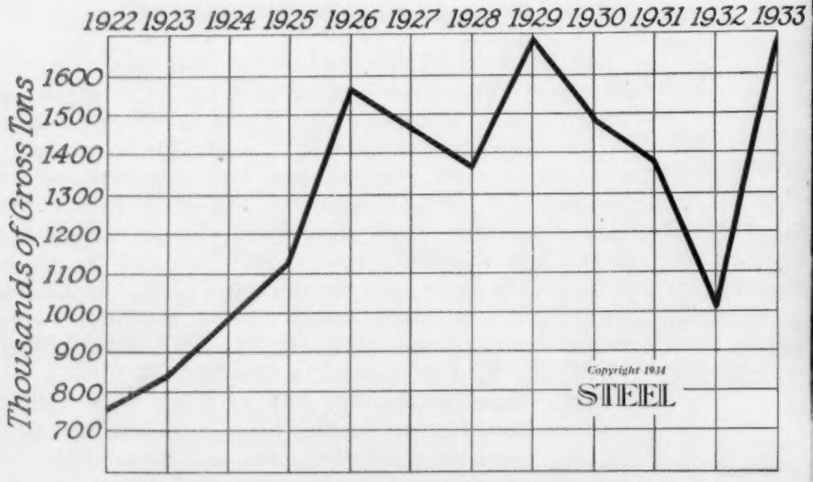
Sheets, hoops and bands were not the only products to share in this revival in container output. Wire, to the amount of 25,925 tons, was used for making handles and reinforcing in 1933. A greater proportion of wire—40,433 tons—was required in 1931, when containers took a total of 1,374,771 tons of steel. In 1929 the wire amounted to 32,494 tons. This suggests that relatively more small cans and those using flat material for handles were made last year.

Paraphrasing the advertisement, for tin cans—such popularity must be deserved. Outranking all other considerations in their everyday use is the easy method of merchandis-



*Newly developed machines were installed in the oil industry in* 1933, *enabling oil companies to can quarts at the rate of* 110 *or more a minute*

*Photo, National Petroleum News*




*Steel consumption for containers in* 1933, *represented by* 1,682,998 *gross tons, was within* 563 *tons of the peak in* 1929. *Since* 1924 *it never has been less than* 1,000,000 *tons annually*

ing. First, they provide for conserving, as well as distributing food products; and they offer means for attractive displays.

The fact tin plate mills were running 90 to 100 per cent of capacity a large share of the time last year is evidence that the material went quickly into consumption. This was in response to the increasing demand for small, economical packages. Certain canned foods are always in greatest demand when housewives have to count their pennies, and when fresh foods are destroyed as a prop to farm prices.

Perfected equipment for cheap and rapid canning of all sorts of products also is an important factor. Probably one reason why the call for steel from container manufacturers increased 68 per cent last year was that the oil industry embarked on a large system of merchandising oil by this method. Many of the best brands of lubricating oils were marketed in 1 and 5-gallon cans.

This has been found to eliminate contamination and substitution, and enables dealers to stock more grades of oil. It has helped to keep filling stations clean and to attract buyers with ornamental stand displays.

The introduction of new machinery for canning nowhere was more conspicuous than in the oil industry. New conveying systems were installed. Quart cans came out of filling machines at the rate of 110 a minute, and efforts now are being made to step this up to 130. Five-gallon cans are filled at the rate of 22 a minute.

Oil companies say "canned oils" enable them to economize in shipping and freight car space, the smaller packages being easier to handle, and every niche of a car filled. Against this, however, is the extra cost of canning, principally represented by wages.

# News of the Week

## Labor

GOVERNMENT officials over the week-end were considering two major labor situations involving the iron and steel industry.

¶President Roosevelt Friday discussed the Weirton Steel Co. case with Attorney General Cummings, Secretary of Labor Perkins, NRA Administrator Johnson and Senator Wagner, chairman of the national labor board.

This case is the outgrowth of the insistence of the Weirton company that it conduct the Dec. 15 election for employe representatives for collective bargaining in accordance with the agreement with the national labor board.

It is reported in Washington that the board's case against the Weirton company is not strong. J. Lawrence Fly, special assistant attorney general working on the Weirton case, is attached to the federal district attorney's office in Pittsburgh.

¶The other situation affects "captive" coal mines of iron and steel producers, a hearing on the position of the United States Steel Corp. being held Jan. 4 and on that of independents Jan. 8.

In accordance with the agreement made with President Roosevelt, elections were held recently at which representatives of the United Mine Workers of America, the coal miners' union, generally won. Mine owners are willing to treat as individuals with officers of the union who were elected to represent their employes, but object to signing a contract with the union.

According to mine owners, every provision of the Oct. 30 agreement has been fulfilled, but it "in no way provides for a contract with the United Mine Workers."

Typifying the attitude of owners, W. D. Evans, counsel for the Jones & Laughlin Steel Corp., said: "In no way can our right to make contracts be infringed on by the labor board. We are asking no privileges. We want only to maintain our constitutional right of liberty of contract."

In the case of the H. C. Frick Coke Co., subsidiary of the Steel corporation, as of independent steel producers and their captive mines, recognition of the miners' union has been refused and the contention made that this refusal is not a matter to be submitted to the board.

Independent steel companies involved in the captive mine case include the Jones & Laughlin Steel Corp., Wheeling Steel Corp., Weirton Steel Co., Crucible Steel Co., and Republic Steel Corp. Because it is now selling some of the output of its Mather mine in the open market and has joined the coal control of western Pennsylvania, Pickands, Mather & Co. were not represented.

¶National labor board has ordered an election held at the Searight mine of the Republic Steel Corp., in Lafayette county, Pennsylvania, this mine having been closed when elections were held at other mines.

¶National Association of Manufacturers is distributing a statement of the facts in the controversy between the Weirton Steel Co. and the national labor board, heretofore referred to. The association supports the contention of E. T. Weir, chairman of the National Steel Corp., of which Weirton is a subsidiary, that he has not defied the administration, has appeared voluntarily before the board, and quotes NRA Administrator Johnson as saying that "Weir helped me on the steel code negotiation more than anyone else."

¶Contracts obtained in December have enabled the Virginia Bridge & Iron Co., Roanoke, Va., to recall a number of furloughed employes.

## Institute

AMERICAN IRON AND STEEL INSTITUTE last week acted in several directions to consolidate its position as the authority for the NRA steel code.

¶It named L. V. Collings, New York attorney and a 1916 graduate of Colgate university, secretary. Mr. Collings' legal training is expected to prove of particular advantage and relieve some of the burden on Gov. Nathan L. Miller, Hoyt Moore, and others. W. S. Tower continues as executive secretary.

¶It appointed Alexander Baxter, formerly of A. Young & Co., accountants, New York, and George Satterthwaite, formerly general manager of Henry Disston & Sons Inc., Philadelphia, and at one time with the Midvale Steel & Ordnance Co., "special investigators as part of the program of the code authority for enforcement of the provisions of the steel code." They will assist the administrative committee and investigate alleged violations of the code.

¶It announced a series of meetings in various cities for the purpose of explaining and interpreting the steel code.

Code members in Indiana, Illinois, Wisconsin, Minnesota, Missouri and Kansas are invited to a meeting at the Palmer house, Chicago, Jan. 16. Those in northern Ohio, Michigan and western New York will assemble at the Hotel Cleveland, Cleveland, Jan. 18. Meetings in Pittsburgh, Philadelphia and New York will be announced later.

¶It selected a new technical committee, holding its first meeting Friday, to advise on technical matters as they affect various products. L. S. Marsh, Inland Steel Co., is chairman. Other members are: V. H. Lawrence, Alan Wood Steel Co.; J. E. Montgomery, Otis Steel Co.; J. J. Shuman, Jones & Laughlin Steel Corp.; C. W. Weesner, Sharon Steel Hoop Co.; H. D. Butts, Corrigan, McKinney Steel Co.;

E. F. Kenney, Bethlehem Steel Co.; J. D. Gold, National Steel Corp.; R. S. Simmons, Pittsburgh Steel Co.; E. F. Lundean, American Rolling Mill Co.; Earl Smith, Republic Steel Corp.; R. G. Glass, Illinois Steel Co.; E. T. Walton, Pittsburgh Crucible Steel Co.; G. A. Reinhardt, Youngstown Sheet & Tube Co.; and J. O. Leech, Carnegie Steel Co.

One of the first tasks of this new technical committee may be to develop uniform nomenclature for special steels and to simplify analyses.

¶Following a meeting Wednesday of its labor committee, the institute Friday released a statement indicating that with November operations averaging 27 per cent, the industry in that month gave employment to 90 per cent of the total payroll list. Even under boom times the proportion does not exceed 95 per cent. The present record is due to the stagger program adopted early in the depression and intensified by the code.

November employment declined 4.19 per cent, compared with a 27 per cent drop in output; payrolls amounted to $32,672,000, compared with $37,977,000 in the preceding month. Total employes at the beginning of December were 390,369, against 416,277 in October.

Average hours per week amounted to 27.8, contrasted with 31.2 in October. Average earnings per hour were 65.9 cents, compared with 64.8 cents in October, and 53 cents in June.

¶The institute has added Frank Purnell, president, Youngstown Sheet & Tube Co., and S. E. Hackett, vice president, Jones & Laughlin Steel Corp., to its administrative committee.

## Merger

REPORTS of a merger or working agreement between the Gulf States Steel Co., Birmingham, Ala., and Republic Steel Corp., Youngstown, O., are revived by the purchase of 15,909 common shares of Gulf States by Field, Glore & Co. from the liquidator of the Globe & Rutgers Fire Insurance Co.

Counsel for the insurance company opposed the sale, stating that it is for the account of Republic and will give Republic control of Gulf States. For this reason, it is claimed more than $35 a share should be paid.

No statement is available from Republic, but in the original Cyrus Eaton program for Republic, Gulf States was included, and the Eaton-organized Continental Shares was a large holder of Gulf States stock.

Gulf States, at Alabama City, Ala., has an annual pig iron capacity of 180,000 tons, steel ingots of 280,000 tons and hot-rolled products of 200,000 tons, including wire rods, bars and wire products.

## Coal

DRASTIC changes in the pricing of western Pennsylvania soft coal for by-product horizontal and vertical retort plants has been authorized by the code authority of western Pennsylvania, subdivision of division No. 1.

Effective Jan. 2 this code authority issued a revised price pamphlet which established soft coal prices by consuming districts, instead of by producing areas as was formerly in effect.

The entire midwestern district as well as New York state and New England are now split up into 11 consuming areas.

Prices on soft coal are now established according to these areas, not according to the mine point of origin.

Area No. 10 of the 11 districts covers movement of soft coal from western Pennsylvania mines to upper Great Lake ports by rail and water.

## Codes

ABOUT Feb. 15 NRA Administractor Johnson will assemble all code authorities and attempt to correlate codes.

As explained by him, efforts will be made to remove conflicts where manufacturers operate under more than one code, and to harmonize as many codes as possible.

Some see in this move an effort to eliminate such blanket code as that fostered by the Machinery and Allied Products institute and possibly to remove part of the immunity to the antitrust laws.

Also, General Johnson may bring up at this conference the possibility of reducing the work-week in all codes, most of which now specify 35 hours. A multiple of eight hours is preferred by General Johnson, possibly foreshadowing a 32-hour week.

¶Directors of the Gray Iron Founders' society, sponsors of a code for gray iron jobbing foundries, met in Cleveland Thursday and elected the following officers:

President, Franklin R. Hoadley, Farrell-Birmingham Mfg. Co. Inc., Ansonia, Conn.; vice president, C. B. Magrath, Northwestern Foundry Co., Chicago; secretary, Walter H. Cole, Moore Brothers Co., Elizabeth, N. J.; and treasurer, R. D. Phelps, Francis & Nygren Foundry Co., Chicago.

Empowered by the code, which is in the executive department of NRA awaiting final approval, directors chose six members of the code authority who, with two representatives to be selected by nonmembers of the Gray Iron Founders' society, will compose the administrative body.

The society representatives are as follows: Franklin R. Hoadley; C. B. Magrath; W. A. Rigsby, Lombard Iron Works & Supply Co., Augusta, Ga.; A. B. Root Jr., Hunt-Spiller Mfg. Corp., Boston; George Branston, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.; and W. H. Winters, American Brake Shoe & Foundry Co., Pittsburgh.

¶Directors of the Malleable Founders' society, administering the code for the malleable iron industry, at a meeting in Cleveland Jan. 4 established regulations for handling interpretations of the code and complaints other than those affecting labor.

A committee of five board members will act as the committee on interpretations and rule on questions submitted to the secretary by members of the industry. A sectional code authority will investigate complaints in each of the three sections of the country. A system for adjusting complaints pertaining to labor will be established.

¶Automobile code has been modified by NRA to permit a 40-hour instead of a 35-hour work-week, it being stated that the 40-hour week permits the industry to absorb its normal supply of labor, while a 35-hour week would result in an influx of labor to automobile centers that would possibly present a relief problem during dull periods.

¶W. Averell Harriman, New York, has been appointed a division administrator of NRA in charge of the construction and other heavy industry codes. He succeeds Malcolm Muir, New York, president, McGraw-Hill Publishing Co., who has resigned to return to his business.

¶NRA Administrator Johnson signed the railway safety appliance code Friday.

¶Code hearings announced: Metal treating industry, Jan. 18; bright wire goods, drapery and carpet hardware, socket screw products, nonferrous hot water tank and tubular and split rivet industries, Jan. 19; reopening of cast iron soil pipe code, postponed from Jan. 16 to Jan. 23; manganese code, Jan. 26.

## Transportation

TRAFFIC committee of the American Iron and Steel institute will withdraw its request to the railroads that they rule that all bills of lading be stamped with the final destination of material to be fabricated in transit.

This decision, reached at Pittsburgh Friday at a meeting attended by the institute, the American Insti-

tute of Steel Construction, the Steel Plate Manufacturers' association and the Independent Steel Fabricators' Traffic association, was believed to have ended the difficulties involving the "F. I. T." privilege.

A hearing scheduled for Chicago, Feb. 28, presumably will be canceled. Only last week the Institute of Steel Construction named a special committee, headed by R. C. Mahon, Detroit, to protest abridgement of the privilege.

¶President Roosevelt has come out in favor of the ICC recommendation that the railroads set up sinking funds to amortize their bonds. The same procedure, the President believes, should be followed by all public utilities. Whether charges for amortization should be considered part of operating expense or should be deducted from earnings the President is not prepared to state.

¶Carnegie Steel Co., Pittsburgh, is planning to send out its 100th tow of steel products down the Ohio river as far as New Orleans. Plans are under way to have the tow leave Pittsburgh plants some time in January.

# Foreign

WHAT some believe may lead to the entry of the British steel industry into the Continental steel entente is an agreement reached on all exports of shipbuilding plates and sections.

Charge d'Affaires Ray Atherton, London, cables to the department of commerce that an agreement for the first half of 1934 has been concluded. British home and Empire markets have been generally reserved to British mills, while the entente undertakes to discontinue price cutting in non-British markets and centralizes export sales in the Stahlwerks Verband of Dusseldorf.

# New Capacity

YOUNGSTOWN SHEET & TUBE CO., noted last week as planning to expand its electric weld mill at the Brier Hill plant in Youngstown, O., to include smaller sizes of electric welded pipe, is installing in its Struthers, O., mill new equipment for the manufacture of railroad spikes. Capacity will be 1000 tons a month.

# Production

STEEL production averaged 30 per cent of capacity in the week ended Jan. 13, a decline of 1 point. Increased orders reported in practically all districts indicate that the downturn will stop shortly. Details for various districts are summarized as follows:

**Youngstown:** Down 6 points to 26 per cent last week, but expected to rebound to above 30 this week when Carnegie's idle Ohio works resumes. Of 83 open hearths 29 are melting. Republic Steel Corp. has resumed in its bessemer department. Alliance Steel Foundries, Alliance, O., has resumed on a 3-day week basis.

**Pittsburgh:** Off 1 point to 21 per cent. Pittsburgh Steel Co. will shortly blow in a blast furnace at Monessen, making 16 out of 60, including Johnstown, active.

**Chicago:** Off 2 points to 32 per cent, with further decline probable. Much of current production is for stock.

**Cleveland-Lorain:** Up 3 points to 54 per cent. Otis lights another open hearth, making 7 on. Corrigan-McKinney drops for several days from 6 to 5, but resumes with 7. National Tube continues with 8 in production.

**Central eastern seaboard:** Down 1 point to 21½ per cent, with little variation expected this week.

**Wheeling:** Gains 6 points to 62 per cent, 24 out of 39 open hearths being on.

**Detroit:** Unchanged at 79. Great Lakes still has all 8 open hearths on, partly for stock. Ford operating 4 (one duplexing) with heat on in fifth.

**Birmingham:** Steady at 52 per cent, 9 open hearths being active at Fairfield and Ensley and 3 at Gadsden.

**Buffalo:** Holding at 29 per cent, with 12 open hearths on. Prospects are for improvement toward end of first quarter.

**New England:** Down 7 points to 88 per cent. One works, touching 100 per cent for a brief period, is now off to 75.

¶United States Steel Corp. in December shipped 600,639 tons of finished products to consumers, greatest for any December since 1929, and comparing with 430,358 tons in November. Total shipments for 1933 were 5,760,952 tons, contrasted with 3,974,062 tons in 1932, 7,676,744 tons in 1931 and 11,624,294 tons in 1930.

¶December output of open-hearth and bessemer steel, as reported to the American Iron and Steel institute, was 1,819,648 gross tons, or 72,786 tons daily, an operating average of 33.48 per cent. In November, the total was 1,540,882 tons and the daily rate 59,265 tons. In December, 1932, only 861,034 tons was produced, and the daily average was 33,117 tons.

For 1933, therefore, the total of ingots stands at 22,878,571 tons, or 71 per cent over the 13,322,833 tons of 1932. Daily average in 1933 was 73,801 tons; in 1932 it was only 42,701 tons. Last year was a 33.95 per cent steel year; 1932 was a 19.75 per cent year (see table below).

## Steel Ingot Production — 1932-33

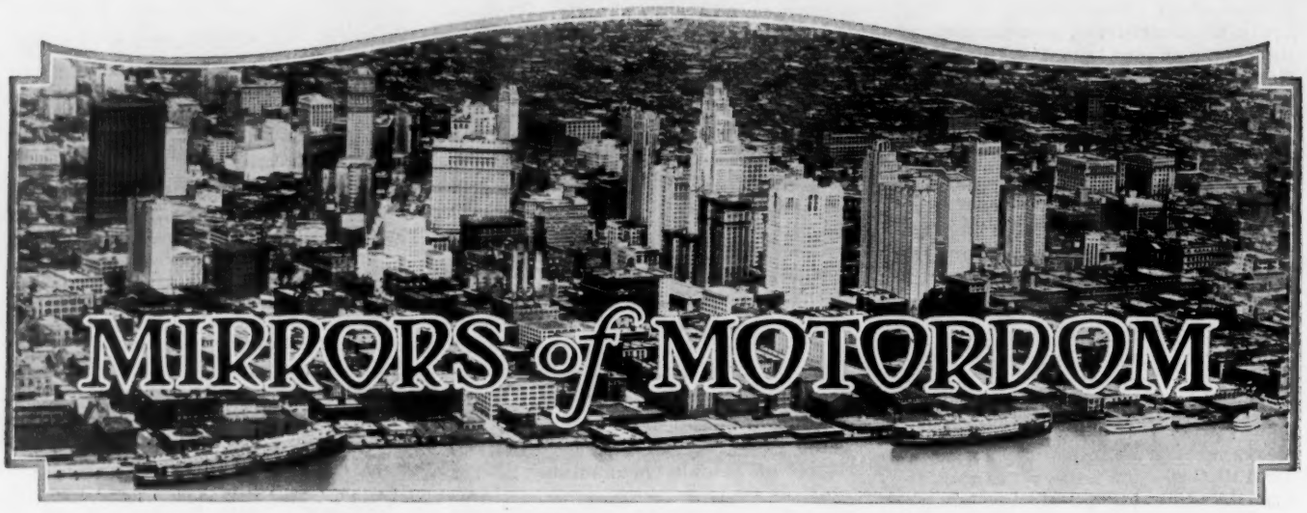
**93.71 Per Cent of Industry Reporting**

**Gross Tons**

| 1932 | Open-hearth | Bessemer | Monthly output companies reporting | Calculated monthly output all companies | No. of working days | Approximate daily output all companies | Per cent operation |
|---|---|---|---|---|---|---|---|
| Jan. | 1,230,907 | 160,633 | 1,391,540 | 1,484,991 | 26 | 57,115 | 26.41 |
| Feb. | 1,230,970 | 157,067 | 1,388,037 | 1,481,252 | 25 | 59,250 | 27.40 |
| Mar. | 1,149,193 | 193,944 | 1,343,137 | 1,433,337 | 27 | 53,087 | 24.55 |
| Apr. | 1,036,163 | 144,197 | 1,180,360 | 1,259,629 | 26 | 48,447 | 22.40 |
| May | 950,838 | 103,593 | 1,054,431 | 1,125,243 | 26 | 43,279 | 20.01 |
| June | 755,068 | 100,249 | 855,317 | 912,757 | 26 | 35,106 | 16.23 |
| July | 653,039 | 102,916 | 755,955 | 806,722 | 25 | 32,269 | 14.92 |
| Aug. | 696,122 | 97,323 | 793,445 | 846,730 | 27 | 31,360 | 14.50 |
| Sept. | 804,470 | 124,970 | 929,440 | 991,858 | 26 | 38,148 | 17.64 |
| Oct. | 885,773 | 132,876 | 1,018,649 | 1,087,058 | 26 | 41,810 | 19.33 |
| Nov. | 838,419 | 128,844 | 967,263 | 1,032,221 | 26 | 39,701 | 18.36 |
| Dec. | 724,917 | 81,932 | 806,849 | 861,034 | 26 | 33,117 | 15.31 |
| Total | 10,955,879 | 1,528,544 | 12,484,423 | 13,322,833 | 312 | 42,701 | 19.75 |
| 1933 | | **96.57 Per Cent of Industry Reporting** | | | | | |
| Jan. | 885,743 | 109,000 | 994,743 | 1,030,075 | 26 | 39,618 | 18.23 |
| Feb. | 922,806 | 126,781 | 1,049,587 | 1,086,867 | 24 | 45,286 | 20.83 |
| Mar. | 784,168 | 94,509 | 878,677 | 909,886 | 27 | 33,699 | 15.50 |
| Apr. | 1,180,893 | 135,217 | 1,316,110 | 1,362,856 | 25 | 54,514 | 25.08 |
| May | 1,716,482 | 216,841 | 1,933,323 | 2,001,991 | 27 | 74,148 | 34.11 |
| June | 2,211,657 | 296,765 | 2,508,422 | 2,597,517 | 26 | 99,904 | 45.96 |
| July | 2,738,083 | 355,836 | 3,093,919 | 3,203,810 | 25 | 128,152 | 58.95 |
| Aug. | 2,430,750 | 370,370 | 2,801,120 | 2,900,611 | 27 | 107,430 | 49.42 |
| Sept. | *1,991,225 | *242,016 | *2,233,241 | *2,312,562 | 26 | *88,944 | *40.92 |
| Oct. | *1,847,756 | 191,673 | *2,059,429 | *2,111,866 | 26 | *81,226 | 37.37 |
| Nov. | 1,331,091 | 156,939 | 1,488,030 | 1,540,882 | 26 | 59,265 | 27.26 |
| Dec. | 1,624,447 | 132,787 | 1,757,234 | 1,819,648 | 25 | 72,786 | 33.48 |
| Total | 19,665,101 | 2,428,734 | 22,093,835 | 22,878,571 | 310 | 73,801 | 33.95 |

Figures exclude crucible and electric ingots. Operating percentages for 1932 are based on 67,473,630 gross tons annual capacity as of Dec. 31, 1931; for 1933, on 67,386,130 gross tons annual capacity as of Dec. 31, 1932.

*Revised.




## New Chrysler Chances Good

• • •

## Ford Will Go on Air Feb. 1

• • •

## Marmon, Revived, To Be 16

*DETROIT*

NOW that all manufacturers of automobiles have introduced their new models for 1934, the full scope of Chrysler's "noble experiment" in radically streamlining Chryslers and DeSotos can be realized.

If the new design goes over—and the chances are in its favor—it will revolutionize the course of automobile body construction, much as Hudson did about 15 years ago when it brought out the coach at the same price as the touring car, inaugurating the closed body era.

Even competitors concede that Chrysler is on the right track and that it will be only a short time before all passenger cars are blunt and broad both front and rear. The only difference of opinion now is whether the transition can be effected at one leap, or whether the public must be educated gradually—a process to which both Reo and Graham have contributed.

Certain as it is of the scientific basis for streamlining, Chrysler itself is not sure it can swing the public abruptly. Despite all the ballyhoo, only Chrysler and DeSoto, which in 1933 accounted for only 20 per cent of all Chrysler Corp. sales, have been redesigned.

The money-making Plymouth and Dodge lines for 1934 have gone no farther toward absolute streamlining than most General Motors cars and Ford, and less in some respects than Hupp, Hudson-Terraplane, Nash and Studebaker.

For success in its venture Chrysler apparently must do two things: It must convince the public that its new models are scientifically aerodynamic and not a designer's fantasy; and second, it must get enough cars on the streets promptly to overcome any reluctance by first buyers to be conspicuous. Toward the first objective Chrysler advertising is assiduously working; the second is up to the sales department.

Human nature being what it is, there probably will be two reactions. Part of the public will agree that streamlining is coming, but will prefer a conservative model to being stared at even though it costs 100 gallons more of gasoline a year.

Others, largely those who have driven their cars three or more years and whose improved position puts them back into the market, will want to compass in one model all of the automobile progress since they last bought. They will want to celebrate their return from financial exile with the newest and smartest thing on wheels.

Based upon past experience, it is almost axiomatic that the bigger an automobile year 1934 is, relatively greater is the probability that Chrysler and DeSoto will attract a large following. Many prospects who recoil at the first inspection of these streamlined models will be impressed by the second look.

Even Chrysler itself at this juncture cannot call the turn on the 1934 market, but there are tremendous potentialities in the step it has taken. If business generally comes back with a rush in the spring, if automobile buying continues the improvement of the last half of 1933, if Chrysler and DeSoto "take," a runaway market is possible.

It can be taken for granted that Plymouth and Dodge will not go through the 1934 model year as they appear today in the event streamlining catches the public fancy. Nor is it likely that other manufacturers will stand idly by if the trend were so strongly toward an aerodynamic consciousness.

Next to Chrysler and DeSoto, Hupp probably is the most streamlined. Hudson-Terraplane may be sorry that it did not adopt its original plans and go the lengths it first contemplated. Studebaker advertising is emphasizing the streamline character of its 1934 models. Cadillac-LaSalle have gone farther in this direction than other General Motors lines.

THOSE smiles automobile executives were wearing at the New York auto show last week only masked their feelings concerning the production situation back home.

Excepting, of course, Ford; Hudson-Terraplane, whose new front axle is less a break with the past; some makers like Hupp, Packard and Graham whose mechanical changes are less radical than the independent front wheel suspension of all General Motors lines and the Chrysler and DeSoto lines of Chrysler, production schedules continue meaningless.

With these exceptions, the entire effort is to get enough new models out to stock dealers. On some of the new lines, particularly the smaller Olds, Chevrolet and Chrysler and DeSoto, not many retail deliveries can be promised before February. Retail orders are accumulating, Plymouth for example claiming 37,000.

Ford, meanwhile, is assembling 2500 to 3000 units a day and gaining. About Feb. 1 Ford will be on the Columbia network from 8:30 to 9 p.m. Sunday evenings and 9:30 to 10 p.m. Thursday evenings, the program to be headed by Fred Waring at $1200 per week.

Marmon is to be revived, putting out a 16-cylinder passenger car, Miller racing cars and high-speed aviation and marine engines. The new company, purchasing the plant, equipment and inventory at Indianapolis, is the American Automotive Corp., with Harry Miller, of Los Angeles; A. D. Sterner and S. N. Wheeler, of Indianapolis; and Preston Tucker, of Detroit, associated.

# WINDOWS OF WASHINGTON

*WASHINGTON*

THE depression is over; all that remains is to pay for it. At the White House, in congress, among visitors to the city, at NRA, in the departments—everywhere in Washington this sentiment is expressed. But as regards paying for it, unanimity of opinion ceases there.

Many — mostly Democrats — believe that too much trouble is being borrowed. They maintain that in his 10 billion dollar budget message to congress the President purposely painted the picture as black as possible and that business will snap back so quickly nowhere near this sum will be required.

Incidentally, any saving under 10 billions will appear to be downright economy and redound to the President's credit.

But even should all these billions be required, a 31 billion dollar national debt in 1935 will not be the burden that the 26 billion dollar debt was in 1919, this group contends, and a nation of 125,000,000 persons eager to work and certain that the worst is behind is bound to cut its way through any jungle.

Others concede that conditions cannot again become so bad, because for one thing the government will not permit or order banks to close, and they too cannot help expressing an inherent conviction in the manifest destiny of this country. But the process to complete recovery will be a long one, punctuated with critical moments, they fear.

They visualize the government, once embarked on the PWA and CWA programs, encountering tremendous difficulties in withdrawing. They wonder if the billions being pumped out will shortly lose the velocity of circulation that is so highly desired and will come to rest as deposits. To foot the bill they see only two possible sources—ruinous taxation of industry, or inflation, or both—and over industry lies the incubus of NRA.

Those who have been most nearly correct in appraising and forecasting developments at Washington since Roosevelt took hold are extremely sober over the situation and are not permitting buoyancy over the present improvement in business to obscure the hazards of the long pull.

## Financing Depression Vexes

• • •

## Soviet-Japanese War Seen

• • •

## NRA Hints 32-Hour Week

An economist whose primary thought concerns finance and who has been entirely out of sympathy with the "young radicals" and "the professors" says:

"The function of government is to provide its citizens the opportunity to work out their destinies in an orderly manner. For four years the capitalistic system has been in a bad way. If after all of the billions that have been pumped into it industry does not 'catch,' then we must admit that our present system is beyond repair.

"The alternative then will be some form of socialism, the first step of which will be the confiscation of all industry by the government."

This economist places judgment day no later than next autumn, and the key to the situation whether the huge PWA and CWA expenditures start the industrial machine going, or whether after a few whirls government money finds its way into bank vaults in the form of deposits or hoards, there to stagnate.

CHEERFUL sentiment, however, is predominant in Washington and the underlying feeling is that somehow the country is rapidly working out of this situation.

General Johnson is privately quoted as saying that the depression is definitely over. As to the deficit and inflation and devaluation of the dollar and other monetary matters, the impression is easily gained that the administration is living from day to day and that the President continues to play by ear, as someone has observed.

It is being said in Washington that President Roosevelt is as lucky with congress as Mr. Hoover was unlucky. This congress promises to be equally as co-operative as at the first session and so far as can be foreseen, it will do the President's bidding and adjourn when he suggests.

Of enormous aid to the President's prestige was the recent United States Supreme Court ruling holding the Minnesota mortgage moratorium law constitutional. Although a 5 to 4 decision, it indicates how the court will divide on further issues in which the constitutionality of the recovery program is at stake.

In brief, the Supreme Court has held that contractual obligations are subordinate to the emergency of recovery. So conservative a member of the court as Chief Justice Hughes voted with the majority.

But this also must be remembered. The Supreme Court makes it plain that legislation which bends the constitution ends when the emergency is past.

There was a time when it was rumored in Washington the President might enlarge the Supreme Court to insure against any adverse ruling on "new deal" legislation, but if he ever had any such purpose—and it could be done by adding several members without the consent of congress—the necessity has passed.

But the court as now constituted seems safely liberal, and besides, any new members the President might appoint would also be liberal.

IN THE early days of the Harding administration, just prior to the Washington arms conference, Washington was in a turmoil over reports that war with Japan was impending.

Now, Washington is again a whis-

pering gallery of rumors, this time linking Japan and Russia. In surprisingly high circles speculation concerning war is heard, and many forecast that hostilities will start within six months.

Time is said to be on the side of Russia, and unless Japan strikes shortly the Trans-Siberian railroad will have been double tracked and the Soviets will be in better position to defend their position east of Lake Baikal.

Enormous orders from both combatants for war materiel, especially for transportation, are visualized. Recent dispatches from Moscow talk of the immediate double tracking of 5900 miles of railroad, laying heavier rails on 12,400 miles of track, and the purchase of 5100 locomotives and 251,000 freight cars of the large American type.

On the basis of 100-pound rails, 5900 miles of track, including fastenings, would require about 1,100,000 tons of steel. If 100-pound rails and commensurate fastenings were used for the 12,400 miles of track to be improved, the steel requirement figures to about 2,170,000 tons. For the cars and locomotives the steel content exceeds 7,000,000 tons.

It is not known that any definite feeler is out, but Washington has been confidently expecting that the recognition of Russia would result in large orders for railroad equipment, and with the arrival of Ambassador Troyanovsky these orders may be one step nearer. Of course, credits still remain the key to Russian business.

Over the past year Japan has been building up her reserves of scrap, of which she has only a small domestic production, chiefly through the purchases in the United States. In 11 months of 1933 Japan took 478,090 gross tons of scrap from dealers in the United States, compared with only 146,802 tons in the corresponding period of 1932.

In 11 months of 1933 American exports of scrap totaled 680,366 tons, a record.

FOR obvious reasons, the navy is in no wise discussing the possibilities of war in the Far East, but the undercurrent in Washington is helpful to the navy program of building up to the treaty maximum.

For ships financed by the PWA allotment of $238,000,000, between 75,000 and 100,000 tons of steel will be required. Some of this has been awarded, but practically none has been rolled owing to the lack of final plans.

The navy continues its development work on high-tensile lightweight steel which will weld. And sentiment for welding is growing. Stainless steel also is in high favor with the navy.

The 1935-39 program, yet to be approved, indicates a total steel requirement of 113,500 tons. Entirely an estimate because detailed plans have not been formulated, this tonnage breaks down as follows:

One aircraft carrier, 11,000 tons; six cruisers, 6500 tons each; five destroyer leaders, 800 tons each; 60 destroyers, 750 tons each, 29 submarines, 500 tons each. In addition, boilers, engines and other equipment would amount to a sizeable tonnage.

NRA has subsided in Washington news and General Johnson has been more of a lamb than a lion recently, talking no more of chiselers, dead cats, or cracking down, shying from any controversy with Henry Ford, and in general becoming just another government official.

But, this may be only the quiet before the storm. In February, possibly about Feb. 15, he contemplates assembling code authorities and trying to correlate all codes in order to make for uniformity and eliminate hardships to those employers whose diversified products bring them under the fire of more than one code.

At this conference it is possible that General Johnson will throw out the suggestion of a shorter workweek than now embodied in any of the major codes. Even if comparatively good business returns shortly he sees the need for a week which will be a multiple of eight hours, indicating a leaning toward a 32-hour week.

Organized labor, by comparison, has been talking of a five-day week, six-hour day. At his press conference last Wednesday, the General went so far as to say that the matter of a shorter week would have to be considered extremely carefully in order not to load an additional burden upon industries now hanging on the ropes financially, lest a series of failures which would defeat the purpose would ensue.

Seemingly paradoxical in advocating a shorter week so soon after permitting the automotive industry to lengthen its normal week from 35 to 40 hours, General Johnson explains that the prospects before the automotive industry are such that it can absorb its normal requirement of labor on the basis of a 40-hour week, and that a shorter week might attract additional labor to Detroit that would complicate relief in off seasons.

Incidentally, the automotive industry has received comparatively better treatment from NRA than any other industry, with indications that the General was so anxious to bring it into line last summer that he made commitments which still bind him.

On two industrialists, General Johnson has become mum as a clam. Andrew Mellon (and the aluminum industry code) is one; Henry Ford is the other. Only last week Comptroller General McCarl again ruled that just because the blue eagle does not fly over Fordson a government department—this time the interior department—cannot ignore the low Ford bid on government trucks.

# Died:

WILLIAM H. JONES, 58, assistant superintendent of the armor plate department, Homestead works, Carnegie Steel Co., Pittsburgh, in Pittsburgh, Jan. 5. He had been identified with the Homestead works for 40 years, the last 20 years of which he had been assistant superintendent in the armor plate department. Well known in metallurgical circles, he had been a frequent contributor to the literature of steel treating.

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Lafayette F. Bryson, 61, superintendent of the Birmingham-Trussville Iron Co. mine, Labuco, Ala., in Birmingham, Ala., Jan. 3.

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Thomas A. McLoughlin, 70 pioneer in the electrical industry and for 25 years recording secretary of the sales committee of the General Electric Co., Schenectady, N. Y., at his home in Schenectady, Jan. 8.

□ □ □

Joseph S. Oechsle, 39, consulting engineer for Worthington Pump & Machinery Corp., Harrison, N. J., in Philadelphia, Dec. 24. He was one of the founders and subsequently president of Metalweld Inc., Philadelphia, manufacturer of portable air compressors, absorbed by the Worthington company in 1931.

□ □ □

Joseph I. Tillman, 67, president, Industrial Steel Casting Co., Toledo, O., and vice president, Wine Railway Appliance Co., in that city recently. At one time with the Merchants Despatch & Transportation Co., he later was associated with the Bostwick-Baum Co., where he remained for 30 years. He resigned to assume the presidency of the Industrial Steel Casting Co.

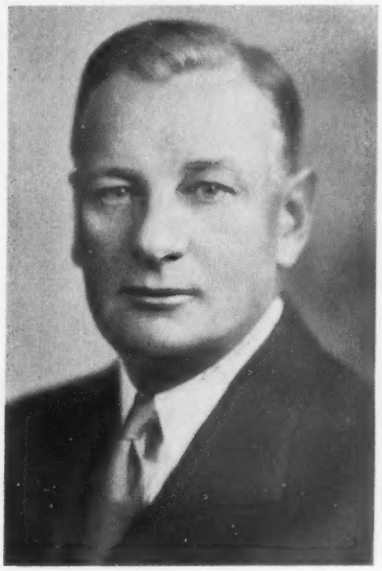
□ □ □

Clinton S. Marshall, 73, former district superintendent of the American Steel & Wire Co., Worcester, Mass., New Haven, Conn., and Trenton, N. J., at his home in Grafton, Mass., Jan. 1. He began work in the wire manufacturing industry at the age of 18 with Washburn & Moen Mfg. Co., Worcester. At one time he was superintendent of the Morgan Construction Co., Worcester. He retired several years ago.

# Industrial Men in the Day's News

## Bethlehem Steel Co. Appoints Three New Vice Presidents

F A. SHICK has been named vice president and controller. He has been with the company since 1906 when he was made auditor, and has been controller of the Bethlehem Steel Co. and its subsidiaries since 1907. He is recognized as an authority on, an originator of and an important contributor to efficient statistical and accounting practices in the steel industry. Accounting methods established by him have been adopted in business courses in leading universities. He is also a director of the company.



J M. LARKIN has been appointed vice president in charge of industrial and public relations. He began work with the company 30 years ago as an apprentice draftsman and since that time has had wide experience in labor affairs, both as an employe and in training and directing working forces. He was made assistant to the president in 1918 when Bethlehem inaugurated its plan of employe representation. He was also in direct charge of the company's work-sharing program, and has been a director for years.

C R. HOLTON has been made vice president in charge of purchasing. He has been active in the steel industry for nearly 33 years, and with Bethlehem or acquired companies since 1906. He became affiliated with the purchasing department of the company in 1916, was made assistant purchasing agent in 1917, purchasing agent in 1920 and a director of the company in 1925. In his new office he will be in direct charge of purchasing for the Bethlehem Steel Co., as well as for various subsidiary organizations.

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J V. HONEYCUTT has been appointed assistant general manager of sales for the Bethlehem Steel Co. Until this appointment he has been in charge of frog and switch sales, having joined the Bethlehem organization a number of years ago. He has represented the company in district sales offices at Atlanta, Ga., New York and other industrial centers.

E. E. Goodwillie has been made assistant to the vice president in charge of sales. He has been active with the company in many capacities, recently as special representative and for a number of years as manager of structural sales.

□ □ □

Charles H. Rhodes has been appointed assistant general manager of sales, in charge of bars and alloy steel, of Illinois Steel Co., Chicago, succeeding William I. Howland Jr., appointed vice president and general manager of sales as noted in STEEL for Jan. 8.

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William P. Gleason, for 25 years general superintendent of the Illinois Steel Co. works at Gary Ind., is not retiring as was stated in STEEL for Jan. 8, this announcement being in error.

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Harry K. Clark, until recently sales manager of the grinding wheel division and acting general sales manager for the Norton Co., Worcester, Mass., has been appointed general sales manager for all divisions. He has been with the company for 19 years.

William R. Moore, director of market research, has been appointed to succeed Mr. Clark as sales manager of the grinding wheel division.

Hugh D. Butler, district NRA compliance director for New England, has been named director of market research for the Norton and affiliated companies.

□ □ □

Norris J. Clarke, vice president in charge of sales, Republic Steel Corp., Youngstown, O., has returned to his duties after a recent illness.

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W. H. Spowers Jr., consulting engineer specializing in galvanizing, 551 Fifth avenue, New York, has been commissioned to rebuild the galvanizing plant of the Lancashire Wire Co. Ltd., Manchester, England.

□ □ □

Charles T. Scott has been appointed sales representative in the Chicago district for Granite City Steel Co., Granite City, Ill., with office at 110 South Dearborn street. He will handle the company's complete line of products—hot-rolled and hot-rolled annealed sheets, galvanized sheets, tin mill black sheets, tin plate and plates.

# EDITORIAL

## Clarification of Open-Price Policy Is Important

EVERY producer, fabricator or manufacturer in a codified industry will do well to watch carefully the significant trends in the present discussions of prices at the price increase hearings of NRA. Last week scores of consumers appeared before Divisional Administrator Whiteside with complaints against alleged exorbitant price increases.

The majority of the complaints were not of serious import because they were either vague, inconclusive or based upon misconceptions. Numerous charges of alleged profiteering, when examined, showed that the complainant in the pre-NRA period had been purchasing his needs at ruinous, below-cost prices and that the prices under NRA, while sharply in excess of the previous scale, were fully justified.

Again, there were complaints from consumers who, having received preferential treatment up to the advent of NRA, protested against the rescinding of their special privileges. For instance, to quote the text of the official release, "E. E. Emerson, purchasing agent for the government printing office, . . . complained bitterly that the government should always get a much lower price than anyone else . . . ."

### Consumers, Viewing Higher Prices Under NRA, Look Askance at Open-Price Plan

In a number of cases where the sharp increases in prices reported were attributed to higher costs necessitated by NRA, it was discovered that the prices went up before the NRA code became effective. Complaints of this kind were most prevalent in the consumers goods industries, such as textiles, food, clothing, etc. Many of the other charges presented at the hearing dealt with technicalities in codes.

While much of this testimony can be dismissed as unimportant, there were several points which came up with recurring regularity throughout the hearing and which involve policies which buyers and sellers of industrial materials and products cannot ignore. First was the resentment expressed generally by consumers against identical quotations, with the inference that price fixing or its equivalent is permitted under the codes. In fact, the attacks on this score were directed more toward open-price provisions than toward outright price fixing.

The most impressive testimony of this kind was that filed by the Mail Order Association of America. The following is a summary of a table of price relationships presented by this association:

| | 1924 | 1926 | 1929 | Dec. 15, 1933 |
|---|---|---|---|---|
| 1. Materials sold under codes without price fixing or under no codes as yet.... | 108.2 | 100.0 | 88.8 | 82.7 |
| 2. Materials sold under codes containing open price provisions ..... | 101.2 | 100.0 | 90.2 | 111.2 |
| 3. Materials sold under approved codes with outright price fixing provisions ..... | 100.8 | 100.0 | 95.5 | 98.6 |

While the range of products embraced in this compilation was not broad enough to give finality to the conclusions, it does constitute an important guide to the tendencies of prices under three methods of control. It serves to indicate that one of the fundamental objectives of NRA—namely, an increase of commodity prices—is being accomplished more effectively in codified industries than in industries not yet operating under codes. It also will tend to focus attention upon the functioning of the open-price policy.

A thorough scrutiny of the price policies of industry probably would be a good thing for everybody. If conflicting opinions could be aired now, while procedure under codes still is in the experimental stage, progress toward a real price structure which would be fair to both buyer and seller undoubtedly would be made more rapidly and more certain. Moreover, a critical examination of objectives and motives would clear up some of the existing misunderstandings.

We believe that the shift from discriminatory price policies to open-price policies by many important industries was a step in the right direction. Certainly it was a much to be desired improvement insofar as motive is concerned. The intent to get away from rebates, hidden concessions, waiving of extras, etc. unquestionably should be encouraged.

However, the objections of complainants do not arise from the intent of the open-price policy but from the tangible results of its operation. Perhaps much of the opposition springs from inequalities in the interpretation of technicalities in the price structure rather than from basic faults in the policy itself.

If this is so, then by all means the structure should be repaired just as fast as weaknesses can be discovered. Under no conditions should details of interpretation and administration be permitted to jeopardize the success of an open-price policy. To go back to the old pawn shop basis of trading would be indefensible retrogression.

# THE BUSINESS TREND

## First Reports for 1934 Show Business Gaining Strength

STATISTICS continue to support the improved sentiment which has prevailed in industry throughout the past few weeks. Reports for December, which are and will be coming through until late in January bear out the earlier evidence that the long decline which started last August was stopped sometime in November, and that December marked the beginning of another stage of recovery.

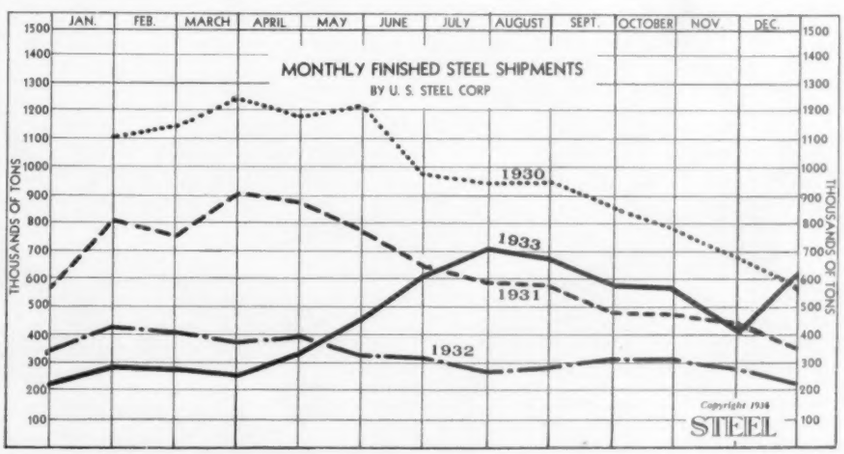
More impressive than the December output of steel ingots and pig iron was the showing of shipments of finished steel by the United States Steel Corp. Whereas in December, 1932, the shipments touched the lowest point in the four years for which figures are available, in December 1933 they totaled 600,639 tons, the highest point for the month of December in any of the four years.

The total for 12 months of 1933 was 5,760,952 tons compared with 3,974,062 tons in 1932. This is a gain of 44.9 per cent in shipments in 1933 over 1932, which is puzzling in view of the fact that the gain in steel ingot output for the entire industry in 1933 over 1932 was 71.7 per cent and that the increase in finished steel for the entire industry probably will approximate 72 per cent.

Weekly records of industrial activity indicate no serious let-down in the year-end period. Freight car loadings and electric power output for the week ending Jan. 6 were up from the figures of the corresponding week of 1933. The recent record of commercial failures has been remarkably good. Reports from industrial centers show encouraging gains in bank deposits, with some definite indications that money is being taken from hoarding. Dividend announcements are more numerous than in many months.

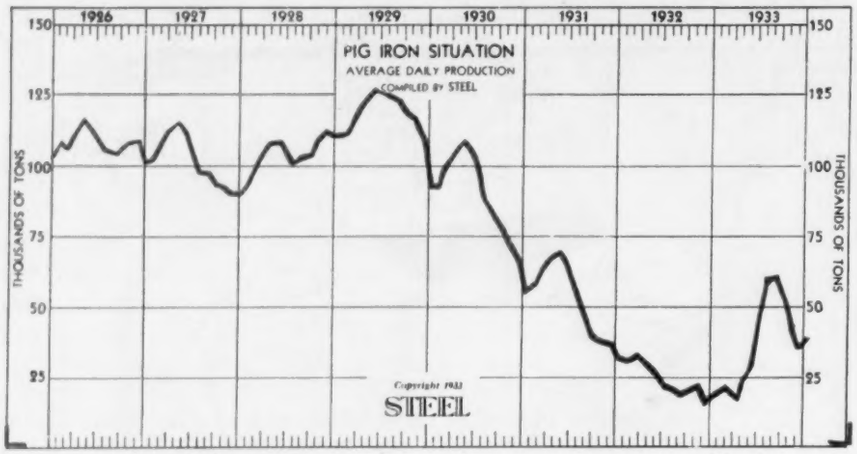
### Feeble Signs of Resumption of Orders for Heavy Equipment Cheers Engineering Firms

Cheerful also is the slight tendency toward release of expenditures for plant and equipment additions and replacements. The almost complete absence of equipment orders in 1933 was a hard blow to many engineering companies. Resumption of repair and maintentnce work on a fairly substantial scale is necessary to restore these companies to a basis of activity comparable with that of steel producing and fabricating units.




| 1933 | Tons |
|---|---|
| Dec. | 600,639 |
| Nov. | 430,358 |
| Oct. | 572,897 |
| Sept. | 575,161 |
| Aug. | 668,155 |

| 1932 | Tons |
|---|---|
| Dec. | 227,576 |
| Nov. | 275,594 |
| Oct. | 310,007 |
| Sept. | 316,019 |
| Aug. | 291,688 |



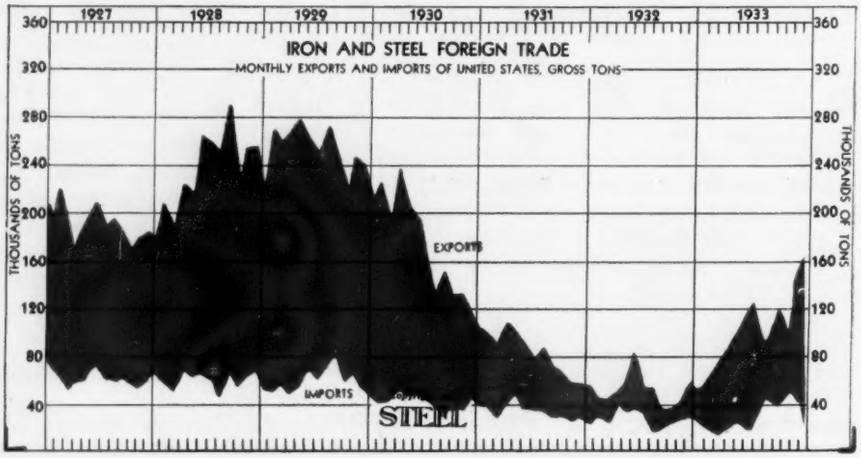

| | |
|---|---|
| December, 1933 | 38,456 |
| November, 1933 | 36,124 |
| December, 1932 | 17,650 |

### December Iron Production Shows Sharp Upturn

The average daily production of coke pig iron in the United States for December was 38,456 tons, a gain of 6.47 per cent over the 36,124-ton rate of the previous month. Normally, December is a month of declining production. The upturn of the past month was the first registered in a December since 1925. Average daily output for 1933 was 36,223 tons, compared with 23,699 tons in 1932, 50,035 tons in 1931 and 86,141 tons in 1930.

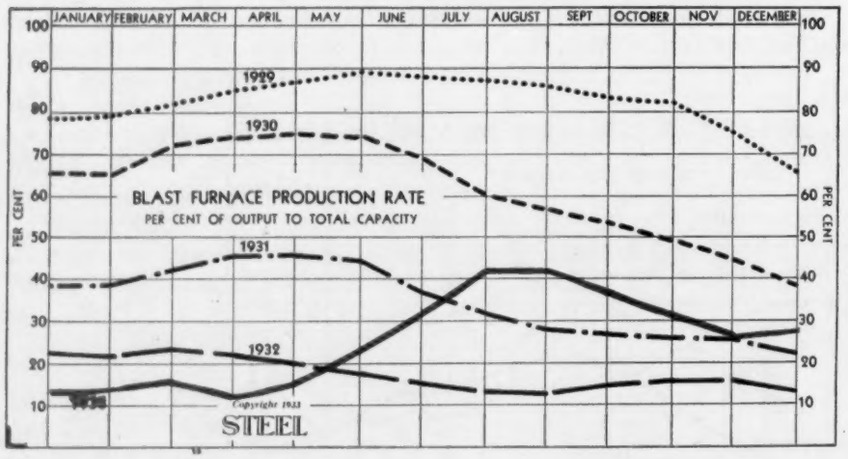
### Steel Exports Taper Off in November; Imports Down

This country's export trade in iron and steel products declined 7155 tons in November to a total of 157,600 gross tons. In November, a year ago, exports amounted to only 56,021 gross tons. For 11 months exports have totaled 1,166,107 tons, a gain of 625,594 tons over the total for 11 months of 1932. November imports at 28,979 tons were the smallest since May, 1933 and 17,694 tons less than in October. Imports during the eleventh month last year totaled 34,924 gross tons.




| Exports | Tons |
|---|---|
| November, 1933 | 157,600 |
| October, 1933 | 164,755 |
| November, 1932 | 56,021 |

| Imports | Tons |
|---|---|
| November, 1933 | 28,979 |
| October, 1933 | 46,673 |
| November, 1932 | 34,924 |



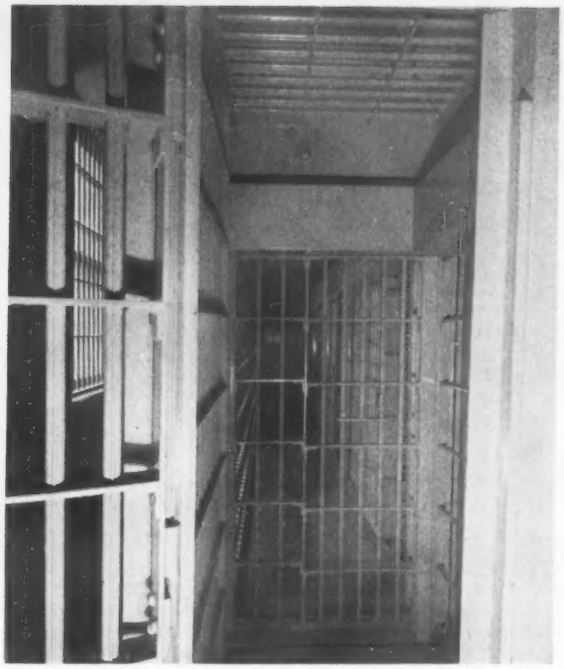

| Blast | Per Cent |
|---|---|
| December, 1933 | 27.9 |
| November, 1933 | 26.2 |
| December, 1932 | 12.5 |

### 74 Blast Furnaces Active At End of Old Year

Although the December output of pig iron, aggregating 1,192,136 tons, gained 108,396 tons over the previous month, there was a loss of three furnaces from the active list. This reduces the total number of furnaces producing iron at the end of the month from 77 on Nov. 30 to 74 on Dec. 31. Relating production to capacity, the operating rate for December was 27.9 per cent compared with 26.2 in November.

# MODERN PRISONS MADE BREAKPROOF BY SPECIAL STEELS

BY E. A. FRANCE
Associate Editor, STEEL

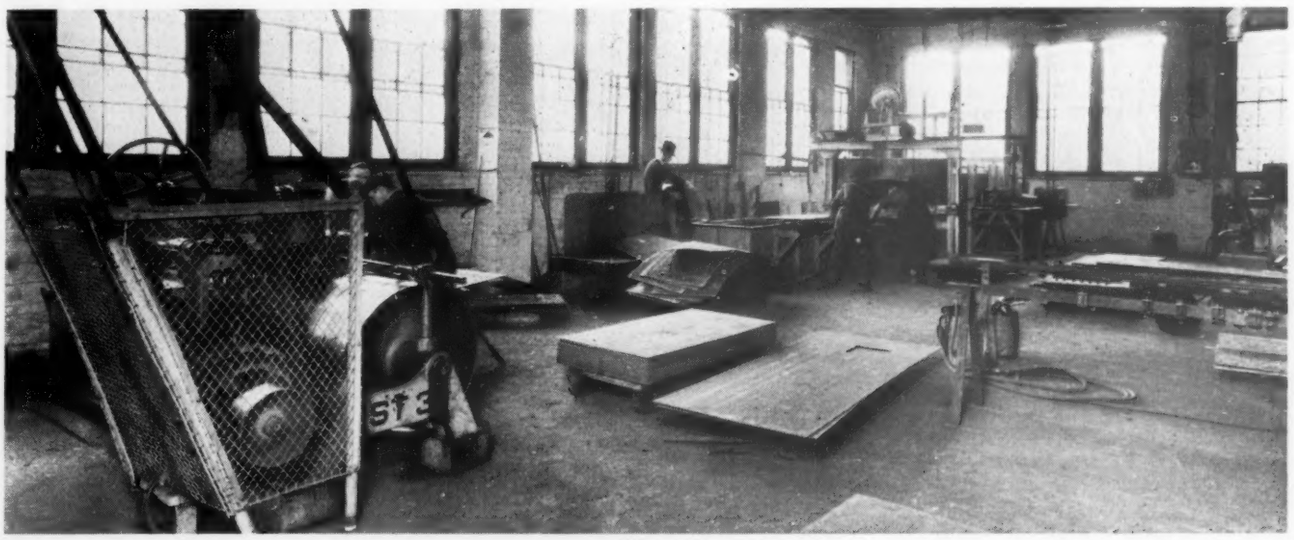


*Modern prisons are made safe by use of double-ribbed bars, flats and plates of tool-resisting characteristics, as shown here. The steel was fabricated by Fries & Son Steel Construction & Engineering Co.*

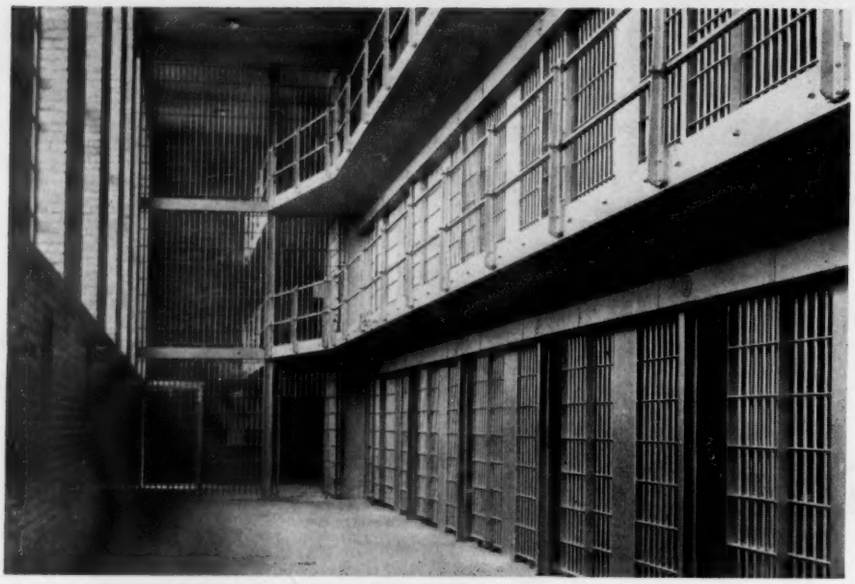
IMPORTANCE of the use to which steel bars and plates are placed in the construction of modern prisons has been the cause of unusual physical demands and consequent special composition of the steel required. The manufacture of bars, plates and some special sections to these requisites constitutes relatively a small tonnage item, yet an interesting detail in the steel industry.

Interest has been directed to the composition of prison steels in a more pronounced manner recently, especially since many states, notable among which is New York, have embarked on a comprehensive, thorough, and long-term planning job of constructing modern penal institutions. With such attention being given to the prison's construction, exhaustive tests have been made on the building's construction materials by state engineer, fabricating shop and prison steel producer.

Prison steels obviously have played a key role, due to the fact that steel is in the final analysis the one material impervious to the special set of dangers inherent in prisons and their occupants. Such tests exemplify the trend of the past quarter century, which has



*Full properties of prison steel plates are developed by heat treatment. This view in the Stewart Iron Works Co. plant shows 5-ply plates in process. After the plates are machined, punched and otherwise fabricated, they are heated in an electric furnace, quenched and straightened in the roller leveler at the left*



*Cell fronts and corridor grating in the state penitentiary, Walla Walla, Wash., fabricated by Fries & Son Steel Construction & Engineering Co. Plate work is 5-ply tool or heat-resisting steel—horizontal and vertical bars making up the grated work are of similar material*

been the gradual replacement with steel of former prisons and cells made of stone and other materials.

Prison steels, as they have resulted today in virtual perfection, are a culmination of over 30 years' experiments, or since the days of the heavy stone-type dungeons where the use of iron and steel was confined to a few small, inaccessible, barred windows. The types of bars considered and produced since have been many in the efforts to be increasingly humane to the prisoner and yet absolutely guarantee his inclusion.

### Depend Upon Alloy Steels

Prison steels are of alloy type, either solid or laminated. The term "prison steel" refers not to the heavy shapes or unexposed structural units but only to those parts of steel which lay open to filing, breakage or even heating. These steels are made by the Colonial Steel Co., Colona, Pa., division of Vanadium-Alloys Steel Co., Pittsburgh; by the Crucible Steel Co. of America, Pittsburgh; and more recently by the Jessop Steel Co., Washington, Pa.

The steel is fabricated by shops especially devoted to the building of prisons and over the country there are six or seven of these concerns, notable among which are: Van Dorn Iron Works, Cleveland; Southern Prison Co., San Antonio, Tex.; Stewart Iron Works, and Fries & Son, both of Covington, Ky.; Pauley Jail Steel Co., St. Louis; and Manly Jail Works, Dalton, Ga.

Round bars and hexagons predominate in prison steels, the total for which may run as high as 500 tons per prison, such as was the amount used in a recent New York state project. In addition, some smaller lots of square bars, as well as flats and plates, are being used. Where needed, rolling has even been made at times on some special channel sections.

Such steels are almost all manufactured to one basic principle, which incorporates the idea of employing plies. Bars are made up of plies, alternately of hard and soft steel. The design of the ply's construction is varied. The plies may number as high as 12 to a small round bar section, even as small as a ¾-inch round. Each of these plies, being set at regular spacing down the length of and inside of the soft steel bar, is in effect a small hardened alloy rod.

The same ply principle is used in the production of prison plates. In this case, the ply is as wide and as long as the plate itself and the plate to all appearances looks like a series of laminated plate sections. A soft steel plate thickness usually forms the outer section.

According to the analysis of the plies, prison steels are divided into two general classifications. One of these, and the type generally used, is commonly known as a carbon-chrome steel with an analysis of 1.00-1.10 carbon and 0.30-0.40 per cent chrome. The other is a nonannealable steel, or heat resisting, possessing self-hardening properties. Both types should be heat treated.

### Increase Number of Plies

The former, or the carbon-chrome ply bar has been produced in a variety of designs. The first type of bar manufactured on a production basis was the five-ply bar. Here the round bar incorporated the principle of two thin rectangularly-shaped hard ply pieces set horizontally within the bar. The ability with which this type might be weakened and then totally severed in some instances led next to the favor of the nine-ply bar.

The principle of the nine-ply bar was the setting of a hollow square of hard ply within the soft steel round or the square bar. This type, due to the fact that the four corners of the insert ply naturally come close to the circumference of the bar was an improvement over the five-ply type. Another type of prison steel bar has as many as 12 alloy rods set in circular form close to the bar's surface.

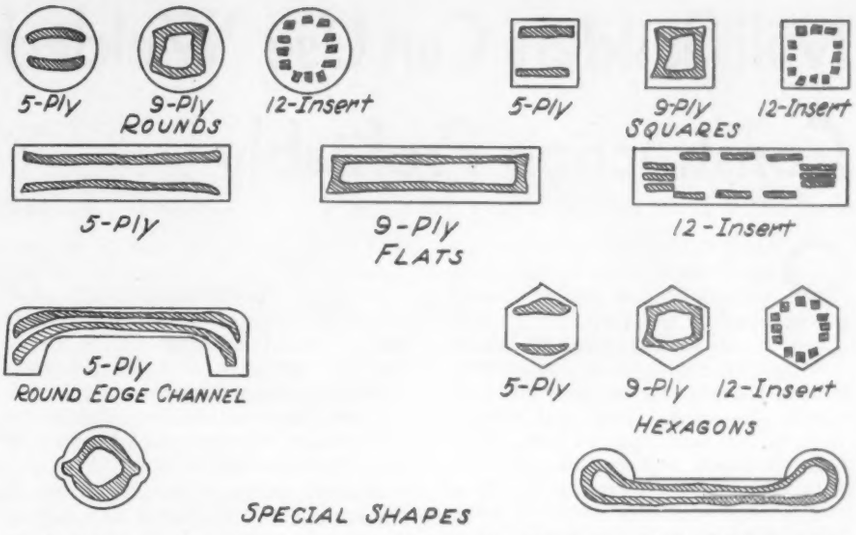
The actual manufacture of prison steels varies little from orthodox steel bar or plate production, with the exception of consideration of the hard insert portions. The hard steel inserts are first assembled into rigid relationship with each other, form-

*A view of the plate and grating assembly aisle in the plant of the Stewart Iron Works Co. Sections of grating are to be seen at the right*

ing a cage based on a steel ring. This ring, which is made of soft steel, may either be welded or secured in some other manner to the cage of inserts.

This cage is then inserted into the ingot mold, being suspended from the top. The ends of the cage stop short of the upper and lower ends of the mold so that the ends of the inserts are entirely covered by the molten soft steel. The cage is actually suspended by means of steel hooks. The hot metal, soft carbon steel, is then bottom cast into the vertical mold. It covers the lower ring and is permitted to cover the upper ends of the inserts to a sufficient degree to permit the pipes in the steel and the crop ends to be cut off the upper end of the ingot without resorting to a cut of the inserts.

When the ingot has hardened the split mold is opened, the ingot removed, cooled and worked out in the usual manner to its final bar form. It is then reduced to a 4 x 4-inch billet, then rolled out into bars, popular sizes of which are mostly ¾ to 1-inch rounds or hexagons. Rounds may be either plain round or ribbed. Throughout all of the reductions to the ingot, the billet and the bar, the hard ply portions are not blended and maintain relatively the same position.




*Typical bar sections produced by the Colonial Steel Co. Carbon-chrome steel ordinarily is used for the plies or inserts; however, for the 12-insert type bars, special heat-resisting steel can be supplied. Rounds and squares are furnished in any size from ⅜ to 3 inches; flats in all sizes up to 8 inches wide; and hexagons in standard sizes of ¼ to 3 inches. The round edge channels are furnished in two sizes, also with 9-ply and 12 inserts. In addition to the two special shapes shown, others may be had in any ply*

## Correspondence Course in Building Design Announced

A revised course in steel building design, given by correspondence study, has been announced by the extension division, University of Wisconsin, Madison, Wis. This course covers the main features of the design of structural steel buildings, such as office buildings, hotels and apartments. Revisions embody latest practices by steel building engineers, a new text and new supplementary material.

## Rod Mill To Handle Four Strands Simultaneously

Advancement in rod mill practice will be demonstrated upon completion early this year of a new 10-inch 4-strand continuous unit at the plant of the Lancashire Steel Corp., Irlam, North Manchester, England. The mill was designed completely by the Morgan Construction Co., Worcester, Mass. A portion of the equipment was manufactured at Worcester and the remainder at the Morgan company's English associate, Davy Brothers Ltd. located at Sheffield, England.

The mill is an advance in the design of rod mills, as previously no units have been built to finish more than two strands of rods simultaneously. Many new devices were required to handle the four strands successfully in feeding from the furnace, in repeating between strands, shearing of the front ends, and in the arrangement of the eight reels required to handle the finished product, as well as disposal of the high production which is at the rate of 40 tons an hour. This mill, similar to the Morgan company's 2-strand rod mills, delivers at a speed of 4000 feet a minute.

*In this department in the Stewart plant, work is laid out and all plates, flats and bars are cut, punched and machined complete*

## Alloy Iron Pipe Discussed

Technical information on the manufacture, applications and performance of Toncan copper-molybdenum iron pipe is presented in a new 24-page booklet being distributed by Republic Steel Corp., Youngstown, O. Advantages of copper-molybdenum iron as a pipe material, its resistance to corrosive attack, welding and fabricating properties and other features are discussed in a manner which will interest the engineer.

## Sells New Aluminum Paint

A circular describing a new aluminum paint is being distributed by the Semet-Solvay Co., New York. It is stated that the paint may be applied successfully over metal, wood, stone, brick, concrete or plaster. It is sold in 1 and 5-gallon double-compartment cans, with correct amounts of aluminum powder and vehicle.

# Mill Builders Can Use Welded Construction Profitably

OPPORTUNITIES which welded steel construction offers to the builder of steel mill equipment are emphasized when consideration is given to the various types of rolling mechanisms required in the production of billets, rails, plates, wire, pipe, sheets, tin plate, structural shapes, bars, strips, rods and the like.

Lloyd Jones, vice president, Continental Roll & Steel Foundry Co., Pittsburgh, discussed advantages to be secured through welding in mill building at a recent meeting of the Association of Iron and Steel Electrical Engineers in Pittsbugh, and prefaced his remarks by stating that he knew of no branch of the machinery industry which calls for the production of such diversified equipment as is required of the mill builder.

Recognition of the fact that welded construction provides in itself a stimulus to the use of rolled steel products has meant that many manufacturers of rolled products are turning to welded construction in the fabrication of their own production equipment, Mr. Jones further pointed out.

Welded steel construction, when properly designed, is generally economical, provided the quantities required are few in number. Considerable importance attaches to the term "properly designed." The mere substitution of one metal for another is not necessarily good engineering. Welded steel construction does not imply the exclusive use of rolled steel products, for steel castings as well as forgings have their place in the economic structure. From the standpoint of the mill builder, Mr. Jones interpreted welded steel construction as the combination of rolled products, castings and forgings, so planned that when welded together they produce the best economical and practical machine construction.

### Combination Is Sound Economy

The welded combination of rolled steel and steel castings lately has come into such prominence that it appears logical for mill builders to engage in the welded fabricating business in connection with their steel foundries. This appears economically sound, since they already possess most of the facilities—buildings, annealing furnaces, cranes and welding and cutting equipment, lacking only shears and bending or forming machines. Furthermore, any scrap produced can be utilized in furnaces for steel castings.

Keeping in step with the spirit of the times, it would seem to be good business for the mill builder to follow along these lines, as it will effect a better balance, saving investments which might otherwise have to be written off as a loss. Furthermore, economy and experience will be important factors in determining the percentage of steel castings used in welded construction.

Recent developments have shown that grain structure of a material has much to do with impact-resisting properties. Therefore, when parts of machines are subject to blows or sudden stresses it may be better engineering to use for that portion of the apparatus a heat treated special steel casting possessing high dynamic properties. It is not always possible to heat treat a complete machine after it is welded, and while the rolled steel may possess high dynamic properties, the weld and adjacent portions may not. This is especially true when it is realized that, to bring out high dynamic properties in steels, quenching is frequently a part of the heat treatment.

### Grain Structure Important

Engineers engaged in the use or manufacture of sheets and tin plate with deep drawing or stamping properties will appreciate readily the importance of proper grain structure and the difficulties in attaining it. Therefore, the metallurgist and chemist should co-operate with the engineer or designer in welded construction, as well as assisting in the manufacture of rolls and special analysis steel castings.

Referring again to properly designed construction, many preconceived ideas ultimately will undergo radical changes and designers will be called upon to exercise considerable ingenuity and study. The rolled products now available are plates and various shapes, such as angles, channels, beams and the like. Most of these shapes have been designed especially for the construction of bridges, buildings and similar structures. When it comes to using them in machine design, they are not so adaptable, and it may be that certain sections should be modified, or new ones developed.

At least one fabricator is having special sections rolled, being fortunate enough to require a sufficient tonnage to warrant the expenditure necessary in shape-rolls and guides. Other manufacturers cannot afford this for their own requirements; however, when bulked together, all of these manufacturers would use a considerable tonnage. Therefore, it might be worthwhile for some engineering society to appoint a committee to study this problem in conjunction with the producers of rolled steel products, thereby helping the designer, standardizing the required shapes and avoiding costly mistakes.

At present mill builders are dependent largely on plates which are sheared, formed and welded together in conjunction with steel castings, cut slabs or forgings. In the forming or shaping of these plates, combining the judicious use of steel castings, lie the possibilities of economical versus extravagant, and pleasing versus awkward designs. A bend in a plate, if performed at low cost, is better than a weld and generally more pleasing to the eye.

### New Equipment Available

The designer, therefore, should familiarize himself with the bending and forming facilities now available. Obviously, where few parts are to be formed, he cannot adapt the costly die and press method used in the manufacture of automobiles and refrigerators. The fabricator is limited, therefore, to bending rolls and other machines which can be rigged inexpensively for forming. One such machine now is available for bending plates ⅜ inch thick and heavier. Equipped with a few simple and standard dies, the machine will produce economically an unbelievable number of various forms and shapes.

The fewer welds required, the less costly will be the construction and the better the product. Designers also should keep in mind that with welded construction, the latest ideas in bearings, lubrication, maintenance, safety and general utility should be incorporated into the designs, since no longer are limitations involved in patterns and casting present.

## Thermit Welding Reviewed

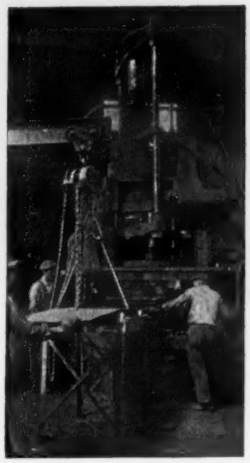
Principle of thermit welding and description of a number of applications are presented in a new illustrated 8-page booklet recently published by the Metal & Thermit Corp., 120 Broadway, New York. Rail welding, reclaiming broken machine parts and repairing steel mill equipment are included in the applications discussed. Cost data are given to show economy of thermit welding.

## Data on Hollow Screws

Engineering data compiled to show the holding power and recommended sizes of hollow set screws, and recommended tightening force of socket head cap screws are contained in an 8-page booklet recently published by the Allen Mfg. Co., Hartford, Conn.

# *Making the Most of*

# METHODS AND MATERIALS



CHROME - NICKEL - MOLYBDENUM cast iron camshafts already are standard in one make of automobile. The material from which this camshaft is made is an electric furnace alloyed iron of the following analysis range: Silicon, 2.20-2.35; sulphur, 0.10 maximum; phosphorus, 0.02 maximum; manganese, 0.50-0.65; combined carbon, 0.55-1.00; total carbon, 3.15; nickel, 0.40-0.50; chromium, 0.80-1.00; and molybdenum, 0.40-0.50 per cent. From the production standpoint, the new camshaft offers many decided economies. As received, the bearings and unchilled portions average around 300 brinell; chilled surface of cams and eccentrics about 75 scleroscope. Consequently, the costly and lengthy operations of copper plating and heat treating are eliminated. This also comprehends elimination of related operations such as packing in carburizing pots, handling and the consequent straightening. Wear tests have been made both in the laboratory and in actual road test—certified calibration shows maximum wear to be less than 0.0003 inch in all cases; steel shafts in equal mileage tests and under the same conditions showed an average wear of 0.001-0.0015 inch.

$ $ $

One manufacturer of high-quality automobiles makes an exceptionally fine cast-iron brake drum of the following composition: Total carbon, 2.50-2.75; silicon, 2.20-2.40; molybdenum, 0.60; manganese, 0.60; phosphorus, 0.20 maximum; and sulphur, 0.10 per cent maximum.

$ $ $

HYDROGEN will attack steel at low temperatures, when under high pressures. In the first stage of the attack, steel absorbs hydrogen, causing embrittlement even though no decarburization or disintegration has occurred. At this stage the steel can be restored to its original state of ductility by a suitable heat treatment to drive off the hydrogen. In the latter stages of the attack, the steel becomes decarburized and fissured, with consequent severe loss in strength and ductility.

$ $ $

Forged chrome-molybdenum steel has been used in all sizes of heavy-duty roll shells for a number of years. From tonnage records established in many parts of the world, it is proved that forged roll shells of 350 to 400 brinell of the composition and treatment recommended will outperform all other steels that have been used for this purpose. An important feature of their service is that they may be worn down to a thin section, often to less than ½ inch thick, before removal.

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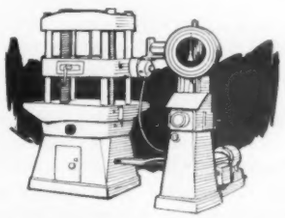
A Middle West foundry has found that impact test results give more reliable information on the ability of cast steels to resist shock in service than do test results on tensile strength and elongation. Grain struc-



tures as shown by micrographs indicate the probable impact values. Heat treatments are of special importance. Similar steels given different heat treatments may give similar tensile strength results, but vary widely in impact resistance. Lack of ability to resist impact has been the cause of many so-called mysterious failures encountered in service.

$ $ $

Nickel is of special value in combating low temperature embrittlement since it toughens steels markedly at low temperatures, exerting its favorable influence alike on cast and wrought steels in any condition of heat treatment. This is true with steels of any carbon content, although at low temperatures as at room temperatures, increase in carbon content means increase in strength and elastic properties with some sacrifice in resistance to impact.

$ $ $

Many truck engine manufacturers and a few passenger car makers have standardized on molybdenum cast iron with nickel or nickel and chromium contents for cylinder blocks and heads. The range of analysis for these castings is as follows: Total carbon, 2.90-3.40; silicon, 1.80-2.30; chromium, 0.15-0.40; nickel, 0.15-1.50; and molybdenum, 0.35-1.50 per cent. The alloyed blocks and heads are said to be superior in strength, hardness, machinability, wear and resistance to shock and heat changes.

$ $ $

PLAIN wrought iron sucker rods, used in the oil industry during the last three years to reduce rod failures, have an ultimate tensile strength about one-half that of the steel rods commonly used. Their performance obviously is due to inherent fatigue resistance, and their actual effective strength while working under corrosion-fatigue conditions is greater than that of the steel rods. Alloyed wrought iron rods, having a tensile strength about 25 per cent greater than that of those previously used, have recently been placed on the market, and now are in service in a few wells. As yet there are insufficient field data upon which to base conclusions as to their value in comparison with that of plain wrought iron rods.

$ $ $

Molybdenum is being used extensively commercially in parts demanding minimum growth. The addition of only 0.50 per cent of this element has been known to reduce growth 50 per cent. One foundry, known for its heat-resisting irons, adds 1.00 per cent molybdenum. To convince itself that this addition was necessary, the percentage was dropped to 0.75 per cent in a few castings. Customers soon complained that those particular castings were not standing up as well as usual. The addition of small percentages of chromium often is included where resistance to oxidation as well as to growth is required.

# PROGRESS IN STEELMAKING

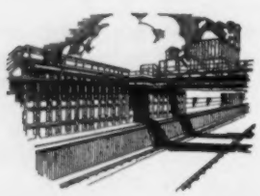
METALLIC lead is the protective element of a newly marketed lubricant claimed to withstand temperatures up to 430 degrees Fahr. Not until 590 degrees Fahr., the melting point of lead, is reached will the lubricating stability be entirely lost. The product is for gear and bearing lubrication and for pump and valve packing, wire line and belt dressing.

♦ ♦ ♦

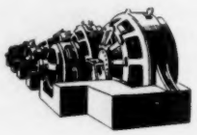
Installing electric furnace transformers outdoors has been made feasible by the development of a low-voltage weather-proof bushing for the terminals of secondary bus bars. Transformers of this type formerly were installed on the interior as a matter of necessity.

♦ ♦ ♦

Quick removable knife arbors on a recently designed rotary trimming shear minimizes the time involved in effecting a change in the setup for different widths of black plate rolled in strip form. At the rear of the rotary cutters are pipe guides through which the side trimmings are directed into a chute. The latter feeds the scrap between a pair of rotary knives which cut the material into lengths capable of being handled conveniently.



CARBONIZING time of coal now can be calculated against the wall temperature of by-product coke ovens using a recently devised formula. Formerly, this was more or less a matter of guesswork. Different coals carbonized at identical wall temperatures require different carbonizing periods, according to results of a recent study. These periods have been found to vary in length as much as 30 per cent. This recently discovered fact is of importance to by-product operators who frequently use different coals. An extension in the carbonizing period might be detrimental in connection with the gas and coke output of a plant requiring higher heats and higher consumption of underfiring which otherwise might not have been considered, and hence, would have a definite effect on plant economy.



PROTECTING motor-driven machinery in coke oven and blast furnace plants and steelworks departments from breakdown because of over-heated bearings is the purpose of a recently marketed bearing thermostat. The unit includes a sealed metallic tube containing a volatile liquid which is connected to a one-piece seamless metal bellows. A temperature rise at the bearing causes an expansion of the liquid and the generation of pressure in the bulb which in turn is transmitted to the bellows causing the contacts to open and bring the machinery to rest.

♦ ♦ ♦

Off-color coils of strip never arise when annealing is executed in an atmosphere of dissociated ammonia gas.

♦ ♦ ♦

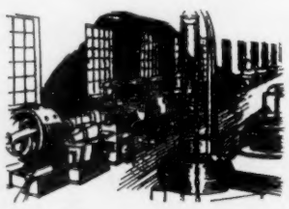
Tensile and dynamic properties of an alloy steel are combined with forgeability and machineability of carbon steel in a newly marketed grade containing manganese, chromium and vanadium and developed for medium stressed parts.

♦ ♦ ♦

A manufacturer of cold-finished steel bars recently was confronted with the perplexing problem of ascertaining the origin of rust which had formed quickly over a shipment of turned and ground shafting. The steel had been well oiled and had not been subject to atmospheric conditions which might ordinarily cause rust to set in. Upon investigation it was found that the shafting in being unloaded from the shipping truck had been rolled across the new wooden floor of the truck body. This flooring had been recently constructed of freshly cut oak wood, the tannic acid from which coming in this brief contact with the shafting had caused rust to set in.

♦ ♦ ♦

Red lead, as compared to other pigments, has a high protective value when applied to the surface of iron and steel commodities. As far as rendering the iron resistant to rust is concerned, the electrochemical interaction between the red lead and the metallic iron of the surfact is of secondary importance.



CONSIDERABLE saving of lubricant at the wire drawing block is said to be effected by immersing the rods in a thin solution of soap before they leave the cleaning house. The resultant film left on the surface greatly reduced the amount of soap used during the drawing operation.

# The Plastic Forming Of Metals

By PROFESSOR DR.-ING. ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

## Part II—Forces and Flow of Material in Technical Forming Processes

### 4. Useful and Friction Work in Rolling (Continued)

AS SHOWN in column 12 of Table V, as much as 80 per cent of the energy produced by the motor can be lost in the drive of the rolling mill. Because the efficiency of the driving motor lies between 75 and 90 per cent, depending upon the load, and because only small losses can possibly occur in the further transmission of power up to the mill, the principal source of loss during cold rolling must be sought in bearing friction. It can be assumed that the bearing friction losses are dependent; first, upon the applied separating force, second, upon the rolling speed, and third, upon the construction and condition of the bearings.

The great extent to which the power loss in the use of sliding bearings with simple drip-feed lubrication is affected by the separating force, can be shown by plotting the absolute power losses, as determined in cold rolling mill, A (Table V, column 11), as a function of the separating force, as shown in Fig. 66. The rolling speed and the type of bearings are the same in this case for all tests, so that they can exert no influence upon the result of this investigation. Excluding the few discrepant values, Fig. 66 shows that with increasing separating force, the power loss at first rises gradually above the light-load power, and then increases linearly with extraordinary rapidity for separating forces greater than 44,100 pounds. With a separating force of 88,200 pounds, the power loss already has reached the power rating of the motor or 18 kilowatts. Severe reductions with mild steel, therefore, were not obtained with this mill. In this connection, the fact should be considered that the length of the strips rolled in mill, A, was only 8.2 feet so that the bearings had no time to become heated. With insufficient cooling of the bearings, it is probable that still more unfavorable results otherwise can be expected in such a cold mill.

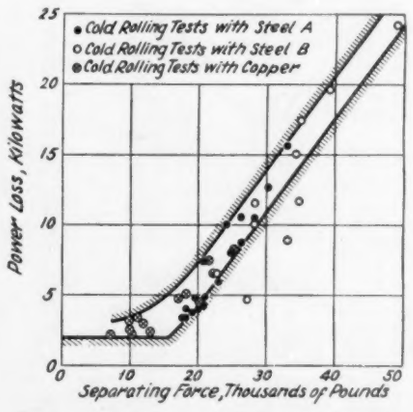



*Fig. 66—Relation of energy loss to separating force in cold-rolling mill, A*

#### Losses Are Compared

If the power losses of the cold mills investigated are to be compared, the differences of rolling speed must be considered. Under otherwise equal relations, the power losses must increase in direct proportion to the rolling speed. If the power losses are corrected accordingly for a rolling speed of 100 feet per minute, which can be done by multiplying the observed losses by the ratio of 100 to the actual rolling speed in feet per minute, a comparative basis is achieved for investigation of the various types of rolling mills. The corrected power losses of the rolling tests, recorded in Tables V and VI, are plotted in Fig. 67 in relation to the separating force. Because the subsequent increase of the power loss in cold mill, B, during the first two test series is eliminated after running-in the bearings, only the lower test values are shown here, and the subsequent increase of the power loss is indicated by arrows. Although the described dependence of the resulting power loss on the separating force appears again in cold mill, A, no such dependence is perceptible in the test results applicable to cold mill B.

The differing behaviour of the cold mills investigated can be understood if the type of roll neck bearings is considered. The sliding bearings installed in cold mill, A, had cross-shaped oil grooves in the crown of the bearing surface, into which the lubricant was conveyed without pressure. For this reason, no load-carrying oil film can be formed in these bearings, because the fluid pressure in the oil grooves always decreases to zero and the oil film thus is destroyed. With the application of rolling force, dry friction, or in the most favorable case, semi-fluid friction, therefore must prevail in such a bearing. With dry friction, however, the frictional work increases in direct proportion to the bearing load. On the lower roll of cold mill B, by means of oil lubrication under pressure and the correct approach of the oil grooves to the unloaded entering side of the bearing shell, trouble from this source was avoided, and fluid friction was maintained even under severe rolling loads. By efficient cooling of the bearing shells, heating of the bearings was prevented as much as possible, and a load-carrying oil film thus maintained. Because of the fluid friction, the power loss in this mill is almost independent of the separating force, as long as the pressure per unit of bearing area does not exceed the load-carrying capacity of the oil film. In this connection, it remains to observe that the pressure per unit of area in such sliding bearings of cold mills, about 700 to 2100 pounds per square inch, is far in excess of the pressure ordinarily encountered in other types of machines. The frictional losses for the upper roll, moreover, were reduced still further by the use of roller bearings.

The comparison of the power losses, shown in Fig. 67, reveals the significance of correct design of bearings for cold mills. The use of sliding bearings with drip-feed lubrication and crossed grooves is inadmissible. On the other hand, cold

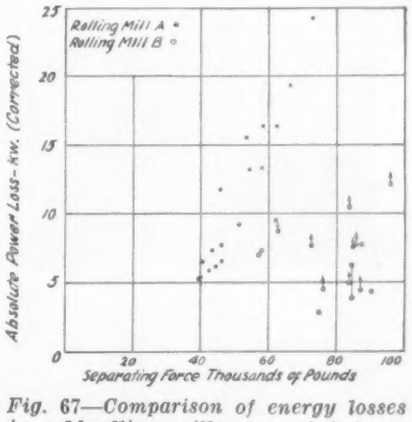



*Fig. 67—Comparison of energy losses in cold-rolling mills, corrected for a rolling speed of 100 feet per minute*

mill, B, shows that with more suitable construction of sliding bearings, even with severe pressures, comparatively favorable performance can be obtained. By equipping all or part of the roll necks with roller bearings, the drive losses can be diminished still further. In this connection, however, the considerably higher price of this type of bearing must be taken into consideration. A further reduction of the driving and forming losses, is obtained in cold rolling mill, B, by the use of a small working roll. By this means, the separating force required for a given draft is diminished simultaneously, which has a favorable influence upon the frictional losses in the bearings, and which, in addition, raises the efficiency of deformation. Because of the absence of the opinion stand, losses arising from this source are eliminated. The gripping capacity, however, is small with this type mill, so that it is applicable principally only for the rolling of strips 0.04-inch and less in thickness.

With respect to the arrangement of roll neck bearings, the development in the construction of cold mills has taken a different course from that pursued in the construction of hot mills. Although every means known in machine construction is employed in the design of cold mills to reduce the bearing friction, bearings of comparatively crude construction, lubricated by grease briquettes, are common on hot rolling mills, in which the heat developed by bearing friction is dissipated by flooding the roll necks with cooling water. The frictional relations in such a bearing never can be favorable. Here the question remains to be explained whether excessively high losses occur in hot mills, as a result of this method of bearing construction; or whether the relations in hot rolling differ fundamentally from those of cold rolling, so that the more simple method of bearing construction, which facilitates the adjustment and changing of rolls, merits preference in this case in spite of its high frictional losses.

### How Tests Were Made

To obtain a conclusion in this respect, cold mill, A, was equipped for hot rolling, by the addition of an arrangement for counterbalancing the upper roll; and mild steel bars about 3.27 feet long were rolled with various reductions, at temperatures from 1292 to 2192 degrees Fahr., to a final size of about 0.39 x 1.18 inches. The bars were heated in a gas-fired muffle furnace. The separating force and rolling power were measured in the same way as in the cold rolling tests originally described. The test results are evaluated and summarized in Table VII. Columns 1 and 2 again contain data on the thickness of the bar. The length of lever arm (column 4) at which the separating force is applied is determined according to equation (40b) from the length of contact (column 3). The torque, calculated from equation (38), is indicated in column 6. In column 8, the angular rotation of the rolls during the passage of the material is computed from the length of the material after the pass (column 7) and the roll radius (3.50 in. = 89 mm.), assuming an average forward slip of 5 per cent. The product of columns 6 and 7 then corresponds to the pure rolling work, which is converted into kilowatt hours and entered in column 9. Column 10 indicates the energy produced by the motor during rolling, which was determined as the product of the measured motor power by the time of rolling. The absolute and relative loss of energy is calculated as the remainder, and is shown in columns 11 and 12.

If the values for the relative loss of energy, according to column 12, are compared with the corresponding values in the cold rolling tests on the same mill (A), and if the few deviating values are neglected, it is apparent that transmission losses of 60 to 80 per cent in cold rolling stand opposite losses of only 30 to 50 per cent in hot rolling. In this connection, the fact should be observed that with small drafts and high rolling temperatures, the motor is only lightly loaded (about 5 kilowatts), so that the light-load losses in this case constitute a high relative loss of energy. A closer comparison of the test values shows that the separating forces in the cold rolling tests, in spite of the small draft, were usually much higher than those in the hot rolling tests, and that in tests with equal separating force the losses in cold rolling exceeded those in hot rolling by 20 to 40 per cent.

The reason for the smaller proportion of losses in the mill during hot

**Table VII**

## Hot Rolling Tests with Mild Steel

| Thickness | | Length of | Lever Arm of | Separating | Rolling | Delivered | Angle of | Rolling | Measured Driving | Energy Loss | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Initial inches | Final inches | contact inches | Separating force inches | force pounds | torque ft. lbs. | length inches | Rotation radius | energy kilowatt hour | energy kilowatt hour | Absolute kilowatt hour | Relative per cent |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| 0.7874 | 0.4055 | 1.157 | 0.488 | 46,100 | 3780 | 45.7 | 12.4 | 0.0176 | 0.0240 | 0.0064 | 27 |
| 0.7874 | 0.4055 | 1.157 | 0.488 | 46,300 | 3790 | 45.9 | 12.4 | 0.0177 | 0.0231 | 0.0054 | 23 |
| 0.7010 | 0.4055 | 1.016 | 0.441 | 39,300 | 2890 | 48.3 | 13.1 | 0.0142 | 0.0193 | 0.0051 | 26 |
| 0.7010 | 0.4055 | 1.016 | 0.441 | 38,800 | 2850 | 48.4 | 13.1 | 0.0140 | 0.0184 | 0.0044 | 24 |
| 0.6300 | 0.4055 | 0.886 | 0.394 | 29,800 | 1945 | 51.3 | 13.9 | 0.0106 | 0.0150 | 0.0044 | 29 |
| 0.6220 | 0.4055 | 0.874 | 0.386 | 30,400 | 1968 | 50.9 | 13.8 | 0.0102 | 0.0145 | 0.0043 | 30 |
| 0.5510 | 0.4055 | 0.717 | 0.331 | 20,500 | 1128 | 53.4 | 14.5 | 0.0062 | 0.0103 | 0.0041 | 40 |
| 0.5510 | 0.4055 | 0.717 | 0.331 | 21,200 | 1164 | 53.1 | 14.4 | 0.0063 | 0.0105 | 0.0042 | 40 |
| 0.4764 | 0.4055 | 0.500 | 0.244 | 10,400 | 427 | 54.9 | 14.9 | 0.0024 | 0.0049 | 0.0025 | 51 |
| 0.4725 | 0.4055 | 0.484 | 0.236 | 10,600 | 420 | 54.7 | 14.8 | 0.0023 | 0.0048 | 0.0025 | 52 |
| 0.7874 | 0.4016 | 1.165 | 0.484 | 33,100 | 2660 | 47.5 | 12.9 | 0.0129 | 0.0214 | 0.0085 | 40 |
| 0.7874 | 0.4016 | 1.165 | 0.484 | 33,100 | 2660 | 47.4 | 12.9 | 0.0129 | 0.0214 | 0.0085 | 40 |
| 0.7050 | 0.3976 | 1.035 | 0.445 | 29,500 | 2190 | 49.3 | 13.4 | 0.0111 | 0.0180 | 0.0069 | 38 |
| 0.7090 | 0.4016 | 1.035 | 0.445 | 29,300 | 2180 | 48.9 | 13.3 | 0.0109 | 0.0180 | 0.0071 | 39 |
| 0.6300 | 0.3937 | 0.909 | 0.402 | 25,600 | 1706 | 51.7 | 14.0 | 0.0090 | 0.0141 | 0.0051 | 36 |
| 0.6340 | 0.4095 | 0.876 | 0.390 | ..... | .... | 50.7 | 13.7 | ..... | ..... | ..... | .. |
| 0.5550 | 0.3937 | 0.752 | 0.343 | 20,900 | 1201 | 54.4 | 14.8 | 0.0067 | 0.0111 | 0.0044 | 40 |
| 0.5590 | 0.3976 | 0.752 | 0.343 | 21,100 | 1215 | 54.5 | 14.8 | 0.0068 | 0.0106 | 0.0048 | 45 |
| 0.4843 | 0.3937 | 0.563 | 0.272 | 12,800 | 579 | 56.6 | 15.4 | 0.0034 | 0.0063 | 0.0029 | 46 |
| 0.4685 | 0.3898 | 0.527 | 0.252 | 12,400 | 521 | 57.8 | 15.7 | 0.0031 | 0.0059 | 0.0028 | 47 |
| 0.7874 | 0.3820 | 1.193 | 0.484 | 24,500 | 1960 | 50.1 | 13.6 | 0.0101 | 0.0165 | 0.0064 | 39 |
| 0.7874 | 0.3898 | 1.181 | 0.476 | 26,200 | 2090 | 49.7 | 13.5 | 0.0106 | 0.0184 | 0.0078 | 42 |
| 0.7050 | 0.3820 | 1.063 | 0.449 | 21,800 | 1627 | 51.7 | 14.1 | 0.0086 | 0.0135 | 0.0049 | 36 |
| 0.7050 | 0.3858 | 1.055 | 0.445 | 21,400 | 1591 | 51.6 | 14.1 | 0.0085 | 0.0141 | 0.0056 | 40 |
| 0.6340 | 0.3820 | 0.941 | 0.409 | 20,900 | 1425 | 53.6 | 14.6 | 0.0079 | 0.0123 | 0.0044 | 36 |
| 0.6340 | 0.3858 | 0.933 | 0.406 | 18,500 | 1237 | 53.7 | 14.6 | 0.0068 | 0.0108 | 0.0040 | 37 |
| 0.5550 | 0.3820 | 0.779 | 0.354 | 16,300 | 962 | 55.4 | 15.1 | 0.0055 | 0.0079 | 0.0024 | 31 |
| 0.5550 | 0.3820 | 0.779 | 0.354 | 16,300 | 962 | 55.5 | 15.1 | 0.0055 | ..... | ..... | .. |
| 0.4725 | 0.3741 | 0.599 | 0.284 | 10,800 | 514 | 58.0 | 15.7 | 0.0030 | 0.0052 | 0.0022 | 42 |
| 0.4725 | 0.3780 | 0.587 | 0.280 | 10,600 | 492 | 57.6 | 15.6 | 0.0029 | 0.0049 | 0.0020 | 41 |

rolling is the fact that, because of the smaller deformation resistance and the greater friction between rolls and bar, the length of contact during hot rolling always can be much greater, in comparison to the roll diameter, than in cold rolling. While the angle of contact (approximately equal to $l_d/r$) was always smaller than 0.1 in the cold rolling tests, it was always greater than this value in hot rolling, and in the tests evaluated in Table VII it even exceeded 0.3 at times. For the same rolling power, which is given according to equation (39a) as the product of the separating force, the rolling speed, and the contact angle, the separating force in cold rolling is accordingly considerably greater than in hot rolling. However, because the absolute drive losses, as has been seen, depend primarily upon the force exerted against the rolls, their proportion relative to the total power or total work also increases correspondingly in cold rolling. From this relation, the rule may be derived that greater attention must be given to the proper installation of roll neck bearings, the smaller is the angle of contact which occurs in the rolling process considered; or, if equal reductions of cross section are effected, the thinner the bar is in comparison to the roll diameter. If this rule is not given the necessary attention, high relative losses of energy during deformation are the inevitable result.

**Hot Rolling Tests Considered**

It will be particularly interesting also to evaluate here, according to the new method, the extensive hot rolling tests conducted by J. Puppe[48], in which force measurements were made. Inasmuch as sections other than rectangular usually were rolled in these tests, and the force relations for this reason are no longer as simple as those of the cases previously discussed, only the bloom-rolling tests from Puppe's investigations have been used for comparison. A reproduction of the test evaluation in detail will not be made here.

The values of the relative loss of work in the bloom-rolling tests varied from 50 to 70 per cent of the total work, which is comparatively unfavorable for hot rolling tests. The high losses can be understood, however, if the fact is considered that the rolling mill was driven by a reciprocating steam engine, in which higher mechanical losses can be expected than in electric drive, especially because the drive included a gear train. A further source of loss is the work of acceleration in starting, which in this case cannot be recovered in reversing, and the magnitude of which Puppe evaluated at about 12 per cent of the work per pass. The fact nevertheless should be considered that the determination of the total work per pass by continuous indicator cards cannot be carried out with the same accuracy as the measurement of an electric rolling mill drive.

Although blooming mills always work with large angles of contact, and favorable relations in this respect prevail even in the rolling of billets and shapes; the contact angle in sheet and strip mills drops to low values, and the proportion of the losses to the total rolling power is correspondingly large in these cases. In these types of rolling mills, therefore, attempts have been made to improve the roll neck bearings. As in the construction of cold mills, effort in this direction is made; first, to increase the angle of contact for equal drafts by the use of small work rolls, and to decrease the separating forces; and second, to diminish the bearing friction by the application of roller bearings. The foregoing investigation shows that these efforts are justified, and that they probably lead to an appreciable reduction in the work of driving the rolling mill in question.

*(To be Continued)*

## Gamma Rays Supplement X-Rays in Weld Inspection

In reviewing progress in welding during 1933 in its issue of Jan. 1, STEEL presented on pages 124 and 125 comments from various authorities in the field, including Gilbert E. Doan, associate professor of the metallurgical engineering, Lehigh university, Bethlehem, Pa. Prof. Doan was credited with stating that "gamma rays are rapidly supplanting X-rays for inspection purposes." This was a mis-statement; the sentence should have read "gamma rays are rapidly supplementing X-rays for inspection purposes."

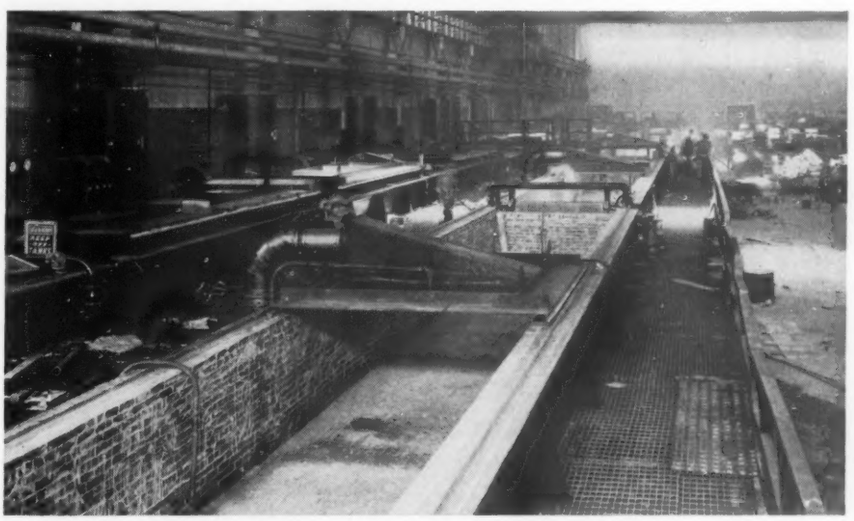
## American Society for Metals New A.S.S.T. Name

American Society for Metals became the new name of the American Society for Steel Treating effective Dec. 20, when mail ballots taken on the change were tabulated. A new constitution also was adopted.

The change in name and revised constitution both had been proposed to enable the society to function more efficiently as its field has broadened during the past few years. The name American Society for Steel Treating had been selected in 1920 when the American Steel Treaters' society and the Steel Treating Research society were merged.

## New Floor Repair Material

A new type of floor repair material, known as Stonhard resurfacer, has been introduced by the Stonhard Co., 401 North Broad street, Philadelphia, for use in building up worn concrete, wood, brick, wood block, asphalt or composition floors. The material is mixed with sand and cement and the mortar is laid cold, ½-inch thick. It is ready for traffic 36 hours after being laid.



*THIS illustration shows a continuous strip pickling unit, 240 feet in length, in a large steel plant. Each of the four tanks is 60 feet long, 7 feet wide and about 5 feet deep. They are equipped with sumps in the end for proper drainage and are emptied by the use of 6-inch lead siphons operated with cold water. The entire unit is lined with ¼-inch 3-ply rubber developed by the B. F. Goodrich Rubber Co., Akron, O., and sheathed with 8-inch brick laid up with acid-resisting cement. The whole installation is ventilated with rubber-lined pipe and rubber-lined fans*

### New Optical Pyrometer Is Self-Contained Unit

Pyrometer Instrument Co., 103 Lafayette street, New York, recently introduced an optical pyrometer

*Optical pyrometer introduced by Pyrometer Instrument Co.*

shown herewith, incorporating three separate direct reading scales. One reads from 1400 to 2000 degrees Fahr.; a second scale reads 1800 to 3400 degrees Fahr.; and a third red scale ranges from 2200 to 3600 degrees Fahr. corrected for direct reading of true spout and pouring temperatures of molten iron and steel when measured in the open. The instrument is self-contained, dust and fool proof. A master lamp for each checking is furnished with the device. The Pyro as it is known, is a universal instrument for measuring and checking high temperatures quickly, accurately and economically.

♦ ♦ ♦

### Comparator and Measuring Unit is Pedestal Type

Jones & Lamson Machine Co., Springfield, Vt., has added to its line of projection machines a new pedestal type comparator and measuring

*Jones & Lamson comparator and measuring machine*

machine, depicted above. It can be furnished without measuring attachments for comparing objects, or attachments can be supplied to provide for vertical, lateral and angular measurements. The unit has been designed to meet the requirements of toolroom, production or laboratory inspection. Light passes from a 50-candlepower lamp through a pair of condensing lenses, across the object, through the projection lenses to the mirror from which the shadow is reflected back to the translucent screen. Three styles of tables can be furnished. For measuring angles a vernier attachment is supplied. A standard 8 x 10-inch photograph attachment also is available.

♦ ♦ ♦

### Cutting Tool Construction Insures Tracking

Borden Co., Warren, O., is marketing a new square-built wheel cutter, shown herewith. Parts are constructed at right angles to each other,

*Square-built wheel cutter developed by Borden Co.*

which gives assurance of tracking. This tool is rugged in construction. The company also is introducing a tubing cutter which is particularly adaptable to thin wall tubing.

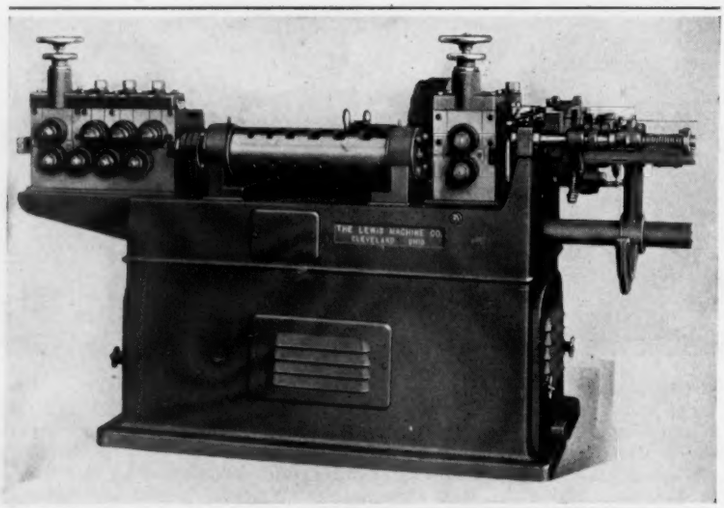
♦ ♦ ♦

### Develops Wire Straightening, Cutting Machine

Lewis Machine Co., 1592-1600 East Twenty-fourth street, Cleveland, has introduced a new model wire straightening and cutting machine, shown at left of this column. Important improvements include complete enclosure of drive gears in oil housings and the use of feed and flywheel transmissions for production work and cutting of short lengths.

Wire is cut by quick action cam and lever. Only a small fraction of a revolution of the flywheel is required for cutting, leaving the remainder of the revolution for feeding wire through the machine. The unit is available with four or six roll straightener ahead of the rotary straightener. Lower straightener rolls are power-driven and each upper roll has a separate adjustment, the last or leveling roll lining up the wire with the center of the arbor.

A combination gage wire stop and release mechanism releases the wire as it is being cut, leaving it free to drop out of the guide bar. This prevents wedging of the cut piece between the end of the cutoff die and the stop which had a tendency to throw a burr on the cut end.



*Lewis wire straightening and cutting machine has new features*

# Rails, Shapes Heavier; Rate Off One Point

## Improvement in Tonnage Indicates Early Reversal in Operating Trend—Carbuilders' Code Delay Causes Some Apprehension—Raw Materials Strong

HEAVIER awards by the railroads and building industry, plus moderate expansion in purchasing by automobile manufacturers and miscellaneous consumers, support the general feeling of encouragement among iron and steel producers.

This improvement, not all of which has yet reached the mills, foreshadows a reversal of the trend in steel production, off 1 point last week to 30 per cent.

New orders booked by some leading steel interests so far this month are ahead of the tonnage placed in the comparable period in December. One of the brightest features of the industrial picture, expected to be translated into orders for steel and steel products shortly, is the evident increase in purchasing power in agricultural areas.

The automobile industry is slowly working out of its production difficulties, but still is far behind schedules for January, insuring that February and March will be correspondingly stronger months. There seems to be no doubt this delay is due to mechanical problems, and not a reflection on markets.

Railroad business is developing more rapidly. Santa Fe has placed 33,000 tons of rails, and will buy 10,000 tons of fastenings shortly. Missouri Pacific has purchased 25,000 tons of rails. St. Louis & San Francisco is to buy 26,000 tons of rails early in February.

### Early Action Expected on Pennsylvania's Tonnage; Industrial Shape Awards Larger

Delay in getting the carbuilders' code approved is holding up some pending car lists which are being financed by the PWA. Bids for heavy tonnages of steel in the Pennsylvania's equipment program are to be taken this week, with opening under the Clayton act in ten days, indicating awards early in February. These include 75,000 tons of steel for 6500 freight cars.

More industrial building projects are noted in structural steel awards for the week which rose to 28,252 tons. The largest reinforcing bar order in many weeks, 3600 tons, was placed for a spillway bridge at Bonnet Carre, La. For two tankers for the Standard Vacuum Transportation Co., New York, 11,400 tons of plates, shapes and bars have been purchased.

American producers are expecting to take 25,000 tons of cast iron pipe for Mexico City, and 9000 tons for Vera Cruz, Mex., announcement of which is expected daily. Government financing is speeding up work on the Hetch Hetchy, California, water project, requiring 17,000 tons of cast pipe and 17,000 tons of welded steel pipe.

Pig iron sales and inquiries are improving much earlier than anticipated. Gradual gains in foundry operations are reflected in increasing coke shipments. Scrap prices continue to rise, STEEL's composite being up 21 cents to $11.08; the sixth consecutive weekly advance registering a total gain of $1.75.

### December Ingot Output Up 22.6 Per Cent; Russia 10,000,000-Ton Prospective Buyer

Daily average steel ingot production for December, 72,786 gross tons, was 22.6 per cent higher than in November. The month's total of 1,819,648 tons brought the output for last year to 22,878,571 tons, compared with 13,322,833 tons in 1932, and 25,192,715 tons in 1931.

Finished steel shipments by the United States Steel Corp. last month increased 39 per cent over November to 600,639 tons. For the year, the corporation's shipments were 5,760,952 tons, 1,786,890 tons more than in 1932.

Demand for finished steel is gaining considerable impetus in Great Britain, according to STEEL's cablegram. Russia is reported to have purchased 36,000 tons of steel products in Poland. Certain Washington officials look for Russia to be a heavy buyer in the near future, estimating steel requirements for its railroad program as 7,000,000 tons for cars and locomotives, and 3,270,000 tons of rails.

Steelworks operations advanced 6 points to 62 per cent in the Wheeling district, and 3 to 54 at Cleveland. They dropped 7 points to 88 in New England; 2 to 32 at Chicago; 1 to 21 at Pittsburgh; 1 to 21½ in eastern Pennsylvania; and 6 to 26 at Youngstown; continuing 79 at Detroit; 52, Birmingham; and 29, Buffalo.

STEEL's iron and steel composite remains $32.42; and the finished steel composite, $51.10.

# COMPOSITE MARKET AVERAGES

| | Jan. 13 | Jan. 6 | One Month Ago Dec., 1933 | Three Months Ago Oct., 1933 | One Year Ago Jan., 1933 | Ten Years Ago Jan., 1924 |
|---|---|---|---|---|---|---|
| Iron and Steel Composite | $32.42 | $32.42 | $32.42 | $31.59 | $28.68 | $43.26 |
| Finished Steel Composite | 51.10 | 51.10 | 51.10 | 49.20 | 46.13 | 67.71 |
| Steelworks Scrap Composite | 11.08 | 10.87 | 10.12 | 10.37 | 6.23 | 18.23 |

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

# A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

| | Jan. 13, 1934 | Dec. 1933 | Oct. 1933 | Jan. 1933 |
|---|---|---|---|---|
| **Finished Material** | | | | |
| Steel bars, Pittsburgh | 1.75 | 1.75 | 1.75 | 1.60 |
| Steel bars, Chicago | 1.80 | 1.80 | 1.80 | 1.70 |
| Steel bars, Philadelphia | 2.04 | 2.04 | 2.04 | 1.91 |
| Iron bars, Terre Haute, Ind. | 1.60 | 1.60 | 1.60 | 1.65 |
| Shapes, Pittsburgh | 1.70 | 1.70 | 1.70 | 1.60 |
| Shapes, Philadelphia | 1.90 | 1.90½ | 1.90½ | 1.70 |
| Shapes, Chicago | 1.75 | 1.75 | 1.75 | 1.70 |
| Tank plates, Pittsburgh | 1.70 | 1.70 | 1.70 | 1.60 |
| Tank plates, Philadelphia | 1.88 | 1.88½ | 1.88½ | 1.66 |
| Tank plates, Chicago | 1.75 | 1.75 | 1.75 | 1.70 |
| Sheets, No. 10, hot rolled, Pitts. | 1.75 | 1.75 | 1.75 | 1.65 |
| Sheets, No. 24, hot ann., Pitts. | 2.25 | 2.25 | 2.25 | 2.05 |
| Sheets, No. 24, galvan., Pitts. | 2.85 | 2.85 | 2.85 | 2.70 |
| Sheets, No. 10, hot rolled, Gary | 1.85 | 1.85 | 1.85 | 1.80 |
| Sheets, No. 24, hot anneal., Gary | 2.35 | 2.35 | 2.35 | 2.25 |
| Sheets, No. 24, galvan., Gary | 2.95 | 2.95 | 2.95 | 2.85 |
| Plain wire, Pittsburgh | 2.20 | 2.20 | 2.10 | 2.15 |
| Tin plate, per base box, Pitts. | 5.25 | 5.25 | 4.65 | 4.25 |
| Wire nails Pittsburgh | 2.35 | 2.35 | 2.10 | 1.90 |
| **Semifinished Material** | | | | |
| Sheet bars, open-hearth, Youngs. | 26.00 | 26.00 | 26.00 | 26.00 |
| Sheet bars, open-hearth, Pitts. | 26.00 | 26.00 | 26.00 | 26.00 |
| Billets, open-hearth, Pittsburgh | 26.00 | 26.00 | 26.00 | 26.00 |
| Wire rods, Pittsburgh | 36.00 | 36.00 | 35.00 | 36.20 |

| | Jan. 13, 1934 | Dec. 1933 | Oct. 1933 | Jan. 1933 |
|---|---|---|---|---|
| **Pig Iron** | | | | |
| Bessemer, del. Pittsburgh | 19.26 | 19.26 | 19.26 | 15.76 |
| Basic, valley | 17.00 | 17.00 | 17.00 | 14.00 |
| Basic, eastern, del. eastern Pa. | 18.76 | 18.76 | 17.76 | 13.50 |
| No. 2 foundry, del. Pittsburgh | 18.76 | 18.76 | 18.76 | 15.76 |
| No. 2 foundry, Chicago | 17.50 | 17.50 | 17.50 | 15.50 |
| Southern No. 2, Birmingham | 13.50 | 13.50 | 13.50 | 11.00 |
| No. 2X, Eastern, del. Phila. | 19.63 | 19.63 | 18.63 | 13.76 |
| Malleable, valley | 17.50 | 17.50 | 17.50 | 14.50 |
| Malleable, Chicago | 17.50 | 17.50 | 17.50 | 15.50 |
| Lake Superior charcoal, del. Chi. | 23.54 | 23.54 | 23.54 | 23.04 |
| Gray forge, del. Pittsburgh | 18.38 | 18.38 | 18.38 | 15.63 |
| Ferromanganese, del. Pittsburgh | 90.24 | 87.24 | 87.24 | 73.24 |
| **Scrap** | | | | |
| Heavy melting steel, Pittsburgh | $12.75 | 12.20 | 12.45 | 8.35 |
| Heavy melting steel, eastern Pa. | 11.50 | 10.25 | 10.19 | 6.50 |
| Heavy melting steel, Chicago | 10.25 | 9.00 | 9.35 | 5.25 |
| No. 1 wrought, eastern Pa. | 12.50 | 11.00 | 10.75 | 6.50 |
| No. 1 wrought, Chicago | 9.80 | 8.45 | 9.10 | 5.00 |
| Rails for rolling, Chicago | 11.25 | 10.35 | 11.10 | 8.05 |
| **Coke** | | | | |
| Connellsville, furnace, ovens | 3.75 | 3.75 | 3.25 | 1.75 |
| Connellsville, foundry, ovens | 4.25 | 4.25 | 3.85 | 2.50 |

# Steel, Iron, Raw Material and Metals Prices

*Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week*

## Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

| | |
|---|---|
| Pittsburgh, base | 1.75c |
| Gary, base | 1.85c |
| Chicago, del. | 1.88c |
| New York, del. | 2.08c |
| Philadelphia, del. | 2.04c |
| Birmingham, base | 1.90c |
| St. Louis, del. | 2.07c |
| F.o.b. cars, dock Pacific ports | 2.42½c |

HOT ROLLED ANN. No. 24

| | |
|---|---|
| Pittsburgh, base | 2.25c |
| Gary, base | 2.35c |
| Chicago, del. | 2.38c |
| Detroit, del. | 2.45c |
| New York, del. | 2.58c |
| Philadelphia, del. | 2.54c |
| Birmingham, base | 2.40c |
| St. Louis, del | 2.57c |
| F.o.b. cars, dock, Pacific ports | 2.95c |

GALVANIZED No. 24

| | |
|---|---|
| Pittsburgh, base | 2.85c |
| Gary, base | 2.95c |
| Chicago, del. | 2.98c |
| Philadelphia, del. | 3.14c |
| New York, del. | 3.18c |
| Birmingham, base | 3.00c |
| St. Louis, del | 3.17c |
| San Francisco, f.o.b. cars, dock | 3.55c |

TIN MILL BLACK No. 28

| | |
|---|---|
| Pittsburgh, base | 2.65c |
| Gary, base | 2.75c |
| St. Louis, del. | 2.97c |

COLD ROLLED No. 10

| | |
|---|---|
| Pittsburgh, base | 2.30c |
| Detroit, delivered | 2.50c |
| Gary, base | 2.40c |
| Philadelphia, del. | 2.59c |
| New York, del. | 2.63c |

COLD ROLLED No. 20

| | |
|---|---|
| Pittsburgh, base | 2.75c |
| Detroit, base | 2.95c |
| Gary, base | 2.85c |
| Philadelphia, del. | 3.04c |
| New York, del. | 3.08c |

ENAMELING SHEETS

| | |
|---|---|
| Pittsburgh, No. 10 | 2.45c |
| Pittsburgh, No. 20 | 2.90c |

## Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

| | |
|---|---|
| Tin plate, coke base, contract | $5.25 |
| Do., stock | 4.55 |
| Long ternes, No. 24 unassorted | 3.25c |

## Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

| | A | B | C | D |
|---|---|---|---|---|
| Bars | 17c | 18.5c | 21c | 26c |
| Plates | 20c | 21.5c | 24c | 29c |
| Sheets | 25c | 28c | 31c | 35c |
| Hot strip | 17c | 18.5c | 21c | 26c |
| Cold strip | 22.5c | 24c | 27c | 35c |

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

## Steel Plates

| | |
|---|---|
| Pittsburgh, base | 1.70c |
| New York, del. | 1.98c |
| Philadelphia, del | 1.88½c |
| Boston, del. | 2.10c |
| Buffalo, del | 1.93½c |
| Chicago, base | 1.75c |
| Cleveland, del. | 1.88½c |
| Birmingham, base | 1.85c |
| Coatesville, base | 1.80c |
| Sparrow's Pt., base | 1.80c |
| Pacific Coast, f.o.b. cars, dock | 2.25c |
| St. Louis, del | 1.97c |

## Structural Shapes

| | |
|---|---|
| Pittsburgh, base | 1.70c |
| Philadelphia, del. | 1.90½c |
| New York, del. | 1.95½c |
| Boston, del. | 2.08½c |
| Bethlehem, base | 1.80c |
| Chicago, base | 1.75c |
| Cleveland, del. | 1.88½c |
| Buffalo, base | 1.80c |
| Birmingham, base | 1.85c |
| Pacific Coast, f.o.b. cars, dock | 2.25c |

## Bars

SOFT STEEL

| | |
|---|---|
| Pittsburgh, base | 1.75c |
| Chicago, base | 1.80c |
| Birmingham, base | 1.90c |
| Buffalo, base | 1.85c |
| Cleveland, base | 1.80c |
| Detroit, del. | 1.90c |
| Pacific Coast ports, cars, dock, c.i.f. | 2.30c |
| Philadelphia, del. | 2.04c |
| Boston, del. | 2.19c |
| New York, del. | 2.08c |
| Pitts., forg. qual. | 1.75c-2.25c |

RAIL STEEL
To Manufacturing Trade

| | |
|---|---|
| Pittsburgh | 1.65c |
| Chicago | 1.70c |
| Cleveland | 1.70c |
| Gary, Ind. | 1.70c |
| Buffalo | 1.75c |

IRON

| | |
|---|---|
| Terre Haute, Ind. base | 1.60c |
| Philadelphia, base | 1.74c |
| Pittsburgh, refined | 2.75c-7.50c |

REINFORCING
New billet, cut lengths, carlots

| | |
|---|---|
| Pittsburgh | 1.90c |
| Chicago, Gary, Buffalo, Cleve., Birm., Young | 1.95c |
| Gulf ports | 2.30c |
| Pacific coast ports | 2.45c |
| Philadelphia, del. | 2.19c |
| Rail steel | |
| Pittsburgh, base | 1.75c |
| Chicago, Buffalo, Cleveland, Birm., Young. | 1.80c |
| Gulf ports | 2.15c |
| Pacific coast ports | 2.30c |

## Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

| | |
|---|---|
| Standard wire nails | $2.35 |
| Cement coated nails | 2.35 |
| Galvanized nails, 15 gage and coarser | 4.35c |
| Do., 16 gage and finer | 4.85c |
| (Per pound) | |
| Polished staples | 3.05c |
| Galvanized fence staples | 3.30c |
| Barbed wire, galv. | 2.85c |
| Annealed fence wire | 2.35c |
| Galvanized fence wire | 2.70c |
| Woven wire fencing (base column, c.l.) | $60.00 |
| Plain wire, 6-9 gage to mfg trade | 2.20c |

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

| | |
|---|---|
| Spring wire | 3.20c |

Chicago and Waukegan $1 higher, Worcester $2 higher.

## Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

| | |
|---|---|
| 10,000 to 19,999 lbs. | 2.10c |
| 20,000 to 59,999 lbs. | 2.05c |
| 60,000 to 99,999 lbs. | 2.00c |
| 100,000 lbs. and over | 1.97½c |

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

## Shafting □ □ □

| | |
|---|---|
| Turned and ground, Pitts. base | |
| 1⅛-inch | 3.40c |
| 1⅛ to 1½-inch | 2.90c |
| 1⅛ to 1⅞-inch | 2.75c |
| 1⅛ to 2⅞-inch | 2.60c |
| 2⅛ to 6-inch | 2.45c |

## Alloy Steel Bars □

Hot rolled

| | |
|---|---|
| Pittsburgh, Buffalo, Chicago, Massillon, Canton | 2.45c |
| Bethlehem | 2.55c |

| Alloy S.A.E. | Diff. | Alloy S.A.E. | Diff. |
|---|---|---|---|
| 2000 | 0.25 | 3100 | 0.55 |
| 2100 | 0.55 | 3200 | 1.35 |
| 2300 | 1.50 | 3300 | 3.80 |
| 2500 | 2.25 | 3400 | 3.20 |

| | |
|---|---|
| 4100 .15 to .25 Mo. | 0.50 |
| 4600 .20 to .30 Mo. 125-1.75 Ni. | 1.05 |
| 5100 .80-1.10 Cr. | 0.45 |
| 5100 Cr. spring | base |
| 6100 bars | 1.20 |
| 6100 spring | 0.70 |
| Cr., Ni., Van. | 1.50 |
| Carbon van | 0.95 |
| 9250.....carbon base plus extras | |

## Strip and Hoops □

| | |
|---|---|
| Hot strip to 23⅛-in. Pittsburgh | 1.75c |
| Do., Chicago | 1.85c |
| Do., del. Detroit | 1.95c |
| Do., del. Phila. | 2.04c |
| Do., del. N. Y. | 2.08c |
| Cooperage hoop, Pittsburgh | 1.85c |
| Do., Chicago | 1.95c |
| Cold-rolled strip, Pitts., Cleve. | 2.40c |
| Worcester | 2.60c |

## Rails, Track Material □

(Gross Ton)

| | |
|---|---|
| Standard rails, mill | $36.37½ |
| Relay rails, Pitts. | |
| 20-45 lbs. | $26.00 |
| 50-60 lbs. | $23.00 |
| 70-75 lbs. | $18.00 |
| 80-85 lbs. | $24.00 |
| 100 lbs. | $25.00 |
| Light rails, billet qual., Pitts., Chi. | $32.00 |
| Do., reroll. qual. | $31.00 |
| Angle bars, mills | 2.55c |
| Spikes, R. R., base | 2.40c |
| Track bolts, base | 3.55c |
| Tie plates, base | 1.90c |

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

## Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

| | |
|---|---|
| All sizes, cut thread | 70 off |
| Rolled thread, ½ x 6 and smaller | 70 off |

MACHINE BOLTS

| | |
|---|---|
| All sizes. cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts | 70 off |
| Tire bolts | 60 off |
| Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size. | |
| Rolled thread machine bolts, ½ x 6 and smaller, | 70 off |
| Step bolts | 66 off |
| Elevator bolts | 66 off |

NUTS

| | |
|---|---|
| Semifinished | 70 off |

HEXAGON CAP SCREWS

| | |
|---|---|
| Milled | 80-10-10 off |
| Upset 1-in., smaller | 85 off |

SQUARE HEAD SET SCREWS

| | |
|---|---|
| Upset, 1-in., smaller | 75-10 off |
| Upset, larger than 1-in. | 75-10 off |
| Headless set screws | 75 off |

## Rivets, Wrought Washers

| | |
|---|---|
| Struc., c.l., Pittsburgh, Cleveland | 2.75c |
| Struc., c.l., Chicago | 2.85c |
| ⅞-in. and smaller, Pitts., Chi., Cleve. | 70 and 10 off |
| Wrought washers, Pitts., Chi., Phila. | 6.00-6.25 off |

## Cut Nails, Piling □

| | |
|---|---|
| Cut nails, Pitts.; (10% discount on size extras) | $2.75 |
| Do. less carloads, 5 kegs or more; no discount on size extras | $3.00 |
| Do., less than 5 kegs; no discount on size extras | $3.15 |
| Steel piling, Pittsburgh | 2.00c |
| Steel piling, Chi., Buff. | 2.10c |

# Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

## Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD
Steel

| In. | Blk. | Gal. |
|---|---|---|
| ¼ and ⅜ | 57 | 38½ |
| ½ | 62 | 50½ |
| ¾ | 65½ | 55½ |
| 1—3 | 67½ | 58½ |
| Iron | | |
| ½ | 31½ | 15 |
| ¾ | 36½ | 20½ |
| 1—1¼ | 39½ | 25½ |
| 2 | 41½ | 26 |

LAP WELD
Steel

| | | |
|---|---|---|
| 2 | 63½ | 54½ |
| 2½—3 | 66½ | 57½ |
| 3½—6 | 68½ | 59½ |
| 7 and 8 | 67½ | 57½ |
| 9 and 10 | 67 | 57 |
| Iron | | |
| 2 | 37 | 22½ |
| 2½—3½ | 38 | 25 |
| 4—8 | 40 | 28½ |
| 9—12 | 38 | 24½ |

LINE PIPE
Steel

| | |
|---|---|
| ⅛-inch, butt weld | 50½ |
| ¼—⅜, butt weld | 56 |
| ½, butt weld | 61 |
| ¾, butt weld | 64½ |
| 1—3, butt weld | 66½ |
| 2-inch, lap weld | 62½ |
| 2½—3, lap weld | 65½ |
| 3½—6, lap weld | 67½ |
| 7—8, lap weld | 66½ |
| Iron | |

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra.

BOILER TUBES

*C. L. Discounts, f.o.b. Pitts.*

| Lap Weld Steel | | Charcoal Iron | |
|---|---|---|---|
| 2—2¼ | 33 | 1¾ | 8 |
| 2½—2¾ | 40 | 2—2¼ | 13 |
| 3 | 47 | 2½—2¾ | 16 |
| 3¼—3¾ | 50 | 3 | 17 |
| 4 | 52 | 3¾—3½ | 18 |
| 4½—6 | 42 | 4 | 20 |
| 1½ | 1 | 4½ | 21 |

In lots of a carload or more, above discounts subject to preferential of two 5% discounts on steel and 10% on charcoal iron.

Lapwelded steel: Under 10,000 lbs., 6 pts. under base and one 5%; on 10,000 lbs. to carload, 4 pts, under base and two 5%. Quantity discounts same as for hot-rolled. Charcoal iron: Under 10,000 lbs., 2 pts. under base; on 10,000 lbs. to carload, base and one 5%.

SEAMLESS BOILER TUBES
*Cold Drawn*

| | | | |
|---|---|---|---|
| 2—2¼ | 27 | 3¼—3½ | 41 |
| 2½—2¾ | 34 | 4 | 46 |
| 3 | 38 | 4½, 5, 6 | 43 |

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

*Hot Rolled*

| | | | |
|---|---|---|---|
| 2—2¼ | 33 | 3¼—3½ | 47 |
| 2½—2¾ | 40 | 4 | 49 |
| 3 | 44 | 4½, 5, 6 | 42 |

Quantity discounts: Under 10,000 lbs., 10 pts. and 5%; 10,000 to 24,999 lbs., 6 pts. and 5%; 25,000 lbs to carload, 2 pts. and 5 and 5%; carload and over, base discount and 5 and 5%. No extra for lengths 24 ft. and under.

## Seamless Tubing □

*Cold drawn; f.o.b. mill disc.*

| | |
|---|---|
| 100 ft. or 150 lbs. | 32% |
| 15,000 ft. or 22,500 lbs. | 70% |

## Cast Iron Water Pipe □

*Class B Pipe—Per Net Ton*

| | |
|---|---|
| 6-in. & over, Birm. | $36.00-37.00 |
| 4-in., Birm. | 39.00-40.00 |
| 4-in., Chicago | 47.00-48.00 |
| 6 to 24-in., Chicago | 44.00-45.00 |
| 6-in. & over, east. fdy. | 40.00 |
| Do., 4-in. | 43.00 |

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base....$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, 5 higher.

## Semifinished Steel □

*Prices Per Gross Ton*

BILLETS AND BLOOMS
*4 x 4 inch base*

| | |
|---|---|
| Pitts., Chi., Cleve., open-hth. & bess. | $26.00 |
| Philadelphia | 31.30 |
| Forging, Pitts., Chi. | 31.00 |

SHEET BARS

| | |
|---|---|
| Pitts., Cleve., Yong. | 26.00 |
| Chicago | 26.00 |
| Canton, O. | 26.00 |

SLABS

| | |
|---|---|
| Pitts., Cleve., Yong. | 26.00 |

WIRE RODS

| | |
|---|---|
| Pitts., Cleveland | 36.00 |
| Chicago | 36.00 |

SKELP

| | |
|---|---|
| All grades, Pitts. and Chicago | 1.60c |

## Coke □ □ □

*Price Per Net Ton*

BEEHIVE OVENS

| | |
|---|---|
| Connellsville fur. | $3.75 |
| Connellsville fdry. | 4.25 |
| Connel. prem. fdry. | 5.00- 5.25 |
| New River fdry. | 6.00 |
| Wise county fdry. | 4.25-5.00 |
| Wise county fur. | 3.50- 4.25 |

BY-PRODUCT FOUNDRY

| | |
|---|---|
| Newark, N. J., del. | 8.71- 9.31 |
| Chi. ov., outside del. | 8.50 |
| Chicago, del. | 9.25 |
| New England, del. | 10.50 |
| St. Louis, del. | 9.25 |
| Birmingham, ovens | 5.00 |
| Indianapolis, del. | 8.75 |
| Ashland, Ky., Connellsville basis | 6.00 |
| Portsmouth, ovens, Connellsville basis | 6.00 |
| Buffalo, ovens | 7.50- 8.00 |
| Detroit, ovens | 8.00 |
| Philadelphia, del. | 9.00 |

## Coke By-Products □

Per gallon, producers' plants.

Tank lots

| | Spot |
|---|---|
| Pure benzol | $0.22 |
| 90 per cent benzol | 0.22 |
| Toluol | 0.30 |
| Solvent naphtha | 0.26 |
| Commercial xylol | 0.26 |

Per lb. f.o.b. New York

| | |
|---|---|
| Pheno, (200 lb. drums) | 0.163c |
| Do., (100 lb.) | 0.173c |

Per lb., producers' plants

| | |
|---|---|
| Naphthalene flakes and balls | 6.00- 7.25 |
| Per 100 lb. Atlantic seaboard | |
| Sulphate of ammonia | $1.25 |

## Pig Iron

Delivered prices do not include switching charges except as noted. No 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25

*Gross Tons*

| | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Basing Points: | | | | |
| Bethlehem, Pa. | $18.50 | $19.00 | $18.00 | $19.50 |
| Birdsboro, Pa. | 18.50 | 19.00 | 18.00 | 19.50 |
| Swedeland, Pa. | 18.50 | 19.00 | 18.00 | 19.50 |
| Sparrows Point, Md. | 18.50 | ..... | 18.00 | ..... |
| From Swedeland, Pa., del. to Phila. | 19.26 | 19.76 | 18.76 | ..... |
| From Bethlehem, del. to Brooklyn | 20.77 | 21.27 | ..... | ..... |
| From Bethlehem, del. to Newark, N. J. | 19.99 | 20.39 | ..... | ..... |
| Basing Point: | | | | |
| Everett, Mass. | 18.50 | 19.00 | 18.00 | 19.50 |
| From Everett, del. to Boston | 19.00 | 19.50 | 18.50 | 20.00 |
| Basing Point: | | | | |
| Buffalo | 17.50 | 18.00 | 16.50 | 18.50 |
| From Buffalo, del. to Boston | 19.00 | 19.50 | 18.50 | 20.00 |
| Basing Points: | | | | |
| Neville Island, Pa. | 18.00 | 18.00 | 17.50 | 18.50 |
| Sharpsville, Pa. | 17.50 | 17.50 | 17.00 | 18.00 |
| Youngstown, O. | 17.50 | 17.50 | 17.00 | 18.00 |
| From Neville Island, Pa., del. to Pittsburgh district | (Neville Island base, plus 63c to $1.13 switching charges) | | | |
| Basing Points: | | | | |
| Erie, Pa. | 17.50 | 18.00 | 17.00 | 18.50 |
| Cleveland | 17.50 | 17.50 | 17.00 | 18.00 |
| Toledo, O. | 17.50 | 17.50 | 17.00 | 18.00 |
| Detroit | 17.50 | 17.50 | 17.00 | 18.00 |
| From Detroit, del. to Saginaw, Mich. | 19.60 | 19.60 | 19.10 | 20.10 |
| From Cleveland, del. to Akron, Canton, O. | 18.76 | 18.76 | 18.26 | 19.26 |
| From Toledo, del. to Mansfield, O. | 19.26 | 19.26 | 18.76 | 19.76 |
| Basing Point: | | | | |
| Hamilton, O. | 17.50 | 17.50 | 17.00 | 18.00 |
| From Hamilton, del. to Cincinnati | 18.51 | 18.51 | 18.01 | 19.01 |
| Do., del. to Indianapolis | 19.77 | 19.77 | 19.27 | 20.27 |
| Basing Points: | | | | |
| Duluth | 18.00 | 18.00 | ..... | 18.50 |
| Chicago | 17.50 | 17.50 | 17.00 | 18.00 |
| Granite City, Ill. | 17.50 | 18.00 | 17.00 | ..... |
| From Duluth, del. to St. Paul | 19.94 | 19.94 | ..... | 20.44 |
| From Chicago, del. to Milwaukee | 18.50 | 18.50 | 18.00 | 19.00 |
| From Chicago, Toledo or Detroit, del. to Muskegon, Mich. | 20.40 | 20.40 | 19.90 | 20.90 |
| From Granite City, del. to St. Louis | 18.00 | 18.50 | 17.50 | ..... |
| Basing Point: | | | | |
| †Birmingham, Ala | 13.50 | ..... | 12.50 | ..... |
| From Birmingham, del. to: | | | | |
| Boston | 18.62 | ..... | 18.12 | ..... |
| Newark, N. J. | 19.58 | ..... | ..... | ..... |
| Brooklyn, N. Y. | 20.39 | ..... | ..... | ..... |
| Baltimore | 19.02 | ..... | 18.52 | ..... |
| Philadelphia | 18.88 | ..... | 18.38 | ..... |
| Cleveland | 19.64 | ..... | 18.64 | ..... |
| Cincinnati | 18.13 | ..... | 17.13 | ..... |
| Chicago | 18.16 | ..... | 19.14 | ..... |
| St. Louis | 17.62 | ..... | 17.50 | ..... |

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron.

| | |
|---|---|
| Basing Point: | |
| Provo, Utah | 16.50 |

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.00. Basing point: Johnson City, Tenn.—$23.00

Philadelphia, standard and copper bearing ..... 24.13

| GRAY FORGE | | CHARCOAL | |
|---|---|---|---|
| Valley furnace | 17.25 | Lake Superior fur. | 20.50 |
| Pitts. dist. fur. | 17.75 | Do., del. Chicago | 23.54 |

SILVERY

Jackson County, O., base; 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base; 10%—$27.25; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25.

## Iron Ore

LAKE SUPERIOR ORE

*Gross ton, 51½% Lower Lake Ports*

| | |
|---|---|
| Old range bess. | $4.30 |
| Mesabi bessemer | 4.65 |
| Old range nonbess. | 4.65 |
| Mesabi nonbess. | 4.50 |
| High phosphorus | 4.40 |

EASTERN LOCAL ORES

*Cents, unit, del. E. Pa.*

| | |
|---|---|
| Foundry and basic, 56-63% con. (nom.) | 8.00- 9.00 |
| Cop.-free low phos. 58-65% (nom.) | 10.00-10.50 |

FOREIGN ORE

*Cents per unit, f.a.s. Atlantic ports Anom.Q*

| | |
|---|---|
| Foreign manganiferous ore, 45-55% iron, 6-10% man. | 10.00 |
| No. Afr. low phos. | 9.50 |
| Swedish basic, 65% | 9.00 |
| Swedish low phos | 9.50 |
| Snapish No. Africa basic, 50 to 60% | 9.00 |
| Tungsten, spot, sh. ton unit, duty pd. | $14.00-14.25 |
| N. F. fdy., 55% | 7.00 |
| Chrome ore 48% gross ton, c.i.f. | $18.00 |

## Manganese Ore

*(Nominal)*

Prices, not including duty, cents per unit, cargo lots.

| | |
|---|---|
| Caucasian, 52-55% | 22.00 |
| So. African, 52% | 21.00-22.00 |
| So. Afr., 49-51% | 20.00-21.00 |
| Indian, 58-50% | nominal |
| Indian, 48-50% | nominal |

## Refractories

FIRE CLAY BRICK

*Per 1000 f.o.b. Works*

*First Quality*

| | |
|---|---|
| Pa., Ohio, Ill., Ky., Md., Ga., Mo. | $45.00 |
| Alabama | 48.00 |

*Second Quality*

| | |
|---|---|
| Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala. | 40.00 |

MALLEABLE BUNG BRICK

| | |
|---|---|
| All bases | 50.00 |

SILICA BRICK

| | |
|---|---|
| Pennsylvania | $45.00 |
| Joliet, E. Chicago | 54.00 |
| Birmingham, Ala. | 55.00 |

MAGNESITE BRICK

| | |
|---|---|
| Dead burned grain, Chester, Pa., Baltimore bases, net | 40.00 |
| Domes, Chewelah, Wash., base | 22.00 |

## Fluorspar

*85 and 5 per cent grade*

| | |
|---|---|
| Washed gravel, duey paid, tide, gross ton | $21.00 |
| Washed gravel, f.o.b. Ill., Ky., net ton, carloads | $14.75-15.00 |

## Ferroalloys

*(In dollars, except Ferrochrome)*

| | |
|---|---|
| Ferromanganese, 78-82% tidewater, duty paid | 85.00 |
| del. Pittsburgh | 90.24 |
| Spiegeleisen, 19-20%, dom., fur., spot† | 26.00 |
| Ferrosilicon, 50%, freight all., cl. | 77.50 |
| Do., less carload | 85.00 |
| Do., 75 per cent | 126-130.00 |
| Spot, $5 a ton higher. | |
| Silicomang., 2½ carb. | 90.00 |
| 2% carbon | 95.00 |
| 1% carbon | 105.00 |
| Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del. | 10.90 |
| Do., spot del. | 10.00 |
| Ferrotungsten, stand., lb. cont. | 1.16- 1.25 |
| Ferrovanadium, 35 to 40%, lb. cont., on analysis | 2.70- 2.90 |
| Ferrotitanium, c. l., prod. plant, frt. allow., net ton | 137.50 |
| Spot, 1 ton, frt., all., lb. | 7.00 |
| Do., under 1 ton | 7.50 |
| Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage | 50.00 |
| Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b Anniston, Ala., 24% $2.75 unitage | 65.00 |
| Ferromolybdenum, stand, 50-60%, lb. | 0.95 |
| Molybdate, lb. cont. | 0.80 |

†Carloads. Quan. diff. apply.

## Nonferrous Mill Products

*F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.00c Conn. copper*

| | |
|---|---|
| **Sheets** | |
| Yellow brass (high | 13.75 |
| Copper, hot rolled | 15.00 |
| Lead, cut, to jobbers | 7.75 |
| Zinc, 100-lb. base | 9.00 |
| **Tubes and Pipes** | |
| High yellow brass | 16.25 |
| Seamless copper | 16.25 |
| **Rods** | |
| High yellow brass | 12.25 |
| Copper, hot rolled | 12.25 |
| **Anodes** | |
| Copper, untrimmed | 12.75 |
| **Wire** | |
| Yellow brass (high) | 14.25 |

## Old Metals

*Deal. buying prices, cents lb.*

| | |
|---|---|
| No. 1 Composition Red Brass | |
| New York | 4.25- 4.50 |
| Chicago | 4.37½-4.87½ |
| Cleveland | 4.75- 5.00 |
| St. Louis | 4.50- 4.75 |
| **Heavy Copper and Wire** | |
| New York | 5.75- 6.00 |
| Chicago, No. 1 | 5.75- 6.00 |
| Cleveland | 5.25- 5.50 |
| St. Louis | 5.50- 5.75 |
| **Composition Brass Borings** | |
| New York | 4.00- 4.25 |
| **Light Copper** | |
| New York | 5.00- 5.25 |
| Chicago | 4.50-4.62½ |
| Cleveland | 4.75- 5.00 |
| St. Louis | 4.50- 4.75 |
| **Light Brass** | |
| Chicago | 2.75- 3.00 |
| Cleveland | 2.50- 2.75 |
| **Lead** | |
| New York | 3.00- 3.25 |
| Cleveland | 2.75- 3.00 |
| Chicago | 2.75- 3.00 |
| St. Louis | 3.25- 3.40 |
| **Zinc** | |
| New York | 2.25- 2.50 |
| Cleveland | 2.25- 2.50 |
| Chicago | 2.00- 2.25 |
| St. Louis | 2.50- 2.75 |
| **Aluminum** | |
| Clips, soft, Cleve. | 13.00-14.00 |
| Borings, Cleveland | 5.50- 6.50 |
| Mixed, cast Cleve. | 8.25- 8.50 |
| Mixed, cast, St. L. | 8.00- 8.50 |

## Secondary Metals

| | |
|---|---|
| Brass ingot, 85-5-5-5 | 8.00 |
| Remelt Al., No. 12 | 12.50 |

# Iron and Steel Scrap Prices

*Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated*

**HEAVY MELTING STEEL**

| | |
|---|---|
| Birmingham | 9.00-10.00 |
| Boston dealers | 5.75- 6.25 |
| Buffalo, No. 1 | 10.50-11.00 |
| Buffalo, No. 2 | 9.00- 9.50 |
| Chicago | 10.00-10.50 |
| Cleveland, No. 1 | 9.75-10.25 |
| Cleveland, No. 2 | 9.50-10.00 |
| Detroit, No. 1 | 8.50- 9.00 |
| Detroit, No. 2 | 7.50- 8.00 |
| Eastern Pa. | 11.50 |
| Eastern Pa., No. 2 | 9.00- 9.50 |
| Federal, Ill. | 8.00- 8.50 |
| Granite City, Ill. | 9.00- 9.50 |
| N. Y., deal. R. R. | 8.00 |
| N. Y., deal. No. 2 | 7.00 |
| Pittsburgh, No. 1 | 12.50-13.00 |
| St. Louis, No. 1 del. | 10.00-10.50 |
| Valleys, No. 1 | 13.00-13.50 |

**COMPRESSED SHEETS**

| | |
|---|---|
| Buffalo, dealers | 9.00- 9.50 |
| Chicago, factory | 8.75- 9.25 |
| Cleveland | 9.00- 9.50 |
| Detroit | 8.50- 9.00 |
| E. Pa., new mat. | 10.50 |
| Pittsburgh | 12.25-12.75 |
| Valleys | 12.00 |

**BUNDLED SHEETS**

| | |
|---|---|
| Buffalo | 6.00- 6.50 |
| Cincinnati, del. | 5.75- 6.25 |
| Cleveland | 6.75- 7.25 |
| Pittsburgh | 10.75-11.25 |
| St. Louis | 5.00- 5.50 |

**SHEET CLIPPINGS LOOSE**

| | |
|---|---|
| Chicago | 5.50- 6.00 |
| Cincinnati | 5.00- 5.50 |
| Detroit | 5.50- 6.00 |
| St. Louis | 4.50- 5.00 |

**STEEL RAILS, SHORT**

| | |
|---|---|
| Birmingham | 11.00-12.00 |
| Boston, dealers | 5.25- 5.50 |
| Buffalo | 12.00-12.50 |
| Chicago (3 ft.) | 11.50-12.00 |
| Chicago (2 ft.) | 12.50-13.00 |
| Cincinnati, del. | 11.00-11.50 |
| Detroit | 9.50-10.00 |
| Pitts., (open-hearth 3 ft. and less | 14.00-14.50 |
| St. Louis | 12.00-12.50 |

**STOVE PLATE**

| | |
|---|---|
| Birmingham | 6.50- 7.50 |
| Boston, dealers | 4.50- 4.75 |
| Buffalo | 9.00- 9.50 |
| Chicago, net | 6.50- 7.00 |
| Cincinnati, dealers | 6.00- 6.50 |
| Detroit, net | 4.50- 5.00 |
| Eastern Pa. | 8.50- 9.00 |
| N. Y., deal. fdry. | 5.00- 5.50 |
| St. Louis | 6.50- 7.00 |

**COUPLERS, SPRINGS**

| | |
|---|---|
| Buffalo | 11.50-12.00 |
| Chicago, springs | 11.00-11.50 |
| Eastern Pa. | 13.50-14.00 |
| Pittsburgh | 14.50-15.00 |
| St. Louis | 11.00-11.50 |

**ANGLE BARS—STEEL**

| | |
|---|---|
| Chicago | 10.50-11.00 |
| St. Louis | 10.00-10.50 |

**LOW PHOSPHORUS**

| | |
|---|---|
| Buffalo, billets and bloom crops | 11.50-12.50 |
| Cleveland, billet, bloom crops | 12.50-13.50 |
| Eastern Pa. crops | 14.00-14.50 |
| Pittsburgh, billet, bloom crops | 16.00-16.50 |
| Pittsburgh, sheet bar crops | 16.00-16.50 |

**FROGS, SWITCHES**

| | |
|---|---|
| Chicago | 10.00-10.50 |
| St. Louis | 9.50-10.00 |

**SHOVELING STEEL**

| | |
|---|---|
| Chicago | 10.00-10.50 |
| St. Louis | 8.25- 8.75 |

**RAILROAD WROUGHT**

| | |
|---|---|
| Birmingham | 7.00- 8.00 |
| Boston, dealers | 5.00- 5.50 |
| Buffalo, No. 1 | 8.00- 8.50 |
| Buffalo, No. 2 | 10.50-11.00 |
| Chicago, No. 1, net | 8.50- 9.00 |
| Chicago, No. 2 | 10.00-10.50 |
| Cincinnati, No. 2 | 8.50- 9.00 |
| Eastern Pa. | 12.00-12.50 |
| N. Y., No. 1 deal. | 7.00- 7.50 |
| St. Louis, No. 1 | 6.00- 6.50 |
| St. Louis, No. 2 | 8.50- 9.00 |

**SPECIFICATION PIPE**

| | |
|---|---|
| Boston | 4.50- 4.75 |
| Eastern Pa. | 10.00 |
| New York, dealers | 4.75- 5.25 |

**BUSHELING**

| | |
|---|---|
| Buffalo, No. 1 | 9.00- 9.50 |
| Chicago, No. 1 | 8.75- 9.25 |
| Cinci., No. 1 deal. | 6.00- 6.50 |
| Cincinnati, No. 2 | 2.50- 3.00 |
| Cleveland, No. 2 | 8.00- 8.50 |
| Detroit, No. 1 new | 7.25- 7.75 |
| St. Louis, No. 1 | 6.50- 7.00 |
| Valleys, new No. 1 | 11.50 |

**MACHINE TURNINGS**

| | |
|---|---|
| Birmingham | 4.00- 4.50 |
| Boston, dealers | 2.75- 3.00 |
| Buffalo | 6.25- 6.75 |
| Chicago | 6.00- 6.50 |
| Cincinnati, dealers | 4.75- 5.25 |
| Cleveland | 7.75- 8.25 |
| Detroit | 5.75- 6.25 |
| Eastern Pa. | 7.00- 7.50 |
| New York, dealers | 2.50- 3.00 |
| Pittsburgh | 8.75- 9.25 |
| St. Louis | 4.25- 4.75 |
| Valleys | 8.00 |

**BORINGS AND TURNINGS**

*For Blast Furnace Use*

| | |
|---|---|
| Boston, dealers | 1.75- 2.00 |
| Buffalo | 7.00- 7.50 |
| Cincinnati, dealers | 4.75- 5.25 |
| Cleveland | 8.00- 8.50 |
| Detroit | 6.50- 7.00 |
| Eastern Pa. | 6.00- 6.50 |
| New York, dealers | 2.00- 2.50 |
| Pittsburgh | 7.50- 8.00 |

**CAST IRON BORINGS**

| | |
|---|---|
| Birming., plain | 4.00- 4.50 |
| Boston, chemical | 8.50- 9.00 |
| Boston, dealers | 3.25- 3.50 |
| Buffalo | 7.00- 7.50 |
| Chicago | 6.50- 7.00 |
| Cincinnati, dealers | 4.75- 5.25 |
| Cleveland | 8.00- 8.50 |
| Detroit | 6.50- 7.00 |
| E. Pa., chemical | 12.00-15.00 |
| New York, dealers | 3.00 |
| Pittsburgh | 7.00- 7.50 |
| St. Louis | 4.00- 4.50 |

**PIPE AND FLUES**

| | |
|---|---|
| Cincinnati, dealers | 4.00- 4.50 |

**RAILROAD GRATE BARS**

| | |
|---|---|
| Buffalo | 6.00- 6.50 |
| Chicago, net | 7.00- 7.50 |
| Cincinnati | 5.25- 5.75 |
| Eastern Pa. | 8.50- 9.00 |
| New York, dealers | 4.25- 4.50 |
| St. Louis | 5.50- 6.00 |

**FORGE FLASHINGS**

| | |
|---|---|
| Boston, dealers | 4.50- 5.00 |
| Buffalo | 8.50- 9.00 |
| Cleve., over 10 in. | 8.50- 9.00 |
| Detroit | 7.25- 7.75 |

**FORGE SCRAP**

| | |
|---|---|
| Boston, dealers | 4.50- 5.00 |
| Chicago, heavy | 11.00-11.50 |
| Eastern Pa. | 10.50-11.00 |

**ARCH BARS, TRANSOMS**

| | |
|---|---|
| St. Louis | 9.75-10.25 |

**AXLE TURNINGS**

| | |
|---|---|
| Boston, dealers | 3.50- 3.75 |
| Buffalo | 7.50- 8.00 |
| Chicago, elec. fur. | 9.00- 9.50 |
| Cleveland | 9.00- 9.50 |
| Eastern Pa. | 11.00 |
| St. Louis | 5.00- 5.50 |

**STEEL CAR AXLES**

| | |
|---|---|
| Birmingham | 11.00-11.50 |
| Boston, ship. point. | 8.00- 8.50 |
| Buffalo | 10.00-11.00 |
| Chicago, net | 10.50-11.00 |
| Eastern Pa. | 14.00 |
| St. Louis | 11.50-12.00 |

**SHAFTING**

| | |
|---|---|
| Boston, ship. point. | 10.25-10.50 |
| Eastern Pa. | 15.50 |
| New York, dealers | 9.50-10.00 |
| St. Louis | 9.00- 9.50 |

**CAR WHEELS**

| | |
|---|---|
| Birmingham, iron | 8.00- 9.00 |
| Boston, iron deal. | 6.00- 6.50 |
| Buffalo, iron | 9.00- 9.50 |
| Buffalo, steel | 11.00-12.00 |
| Chicago, iron | 10.50-11.00 |
| Chi., rolled steel | 11.00-11.50 |
| Cincinnati, iron | 8.25- 8.75 |
| Eastern Pa., iron | 12.00-12.50 |
| Eastern Pa., steel | 13.50-14.00 |
| Pittsburgh, iron | 11.00-11.50 |
| Pittsburgh, steel | 14.75-15.25 |
| St. Louis, iron | 8.00- 8.50 |
| St. Louis, steel | 10.50-11.00 |

**NO. 1 CAST SCRAP**

| | |
|---|---|
| Birmingham | 9.00-10.00 |
| Boston, No. 2 | 5.50- 5.75 |
| Boston, tex. con. | 10.25-10.50 |
| Buffalo, cupola | 10.00-10.50 |
| Buffalo, mach. | 10.50-11.50 |
| Chicago, agri. net | 8.00- 8.50 |
| Chicago, mach. net | 9.00- 9.50 |
| Chi., railroad net | 8.50- 9.00 |
| Cinci., mach. cup | 9.00- 9.50 |
| Cleveland, cupola | 9.50-10.00 |
| Detroit, net | 8.50- 9.00 |
| Eastern Pa., cupola | 11.50-12.50 |
| N. Y., cup. deal. | 6.00- 6.50 |
| N. Y., del. local foundries | 9.00- 9.50 |
| Pittsburgh, cupola | 12.50-13.00 |
| San Francisco, del. | 13.50-14.00 |
| Seattle | 4.50- 6.50 |
| St. Louis, No. 1 | 8.00- 8.50 |
| St. L., No. 1 mach. | 8.50- 9.00 |

**HEAVY CAST**

| | |
|---|---|
| Boston, del. | 6.25- 6.50 |
| Buffalo, break. | 7.50- 8.00 |
| Cleveland, break | 7.25- 7.50 |
| Detroit, break | 6.50- 7.00 |
| Detroit, auto net | 9.25- 9.75 |
| Eastern Pa. | 11.00-11.50 |
| N. Y., No. 1, deal. | 7.00- 7.25 |
| N. Y., break. deal. | 6.75- 7.25 |
| Pittsburgh | 11.50-12.00 |

**MALLEABLE**

| | |
|---|---|
| Boston, consum. | 12.00-12.25 |
| Buffalo | 11.00-11.50 |
| Chicago, R. R. | 10.50-11.00 |
| Cinci., agri. del. | 8.00- 8.50 |
| Cinci., R. R. del. | 8.50- 9.00 |
| Cleveland, rail | 11.00-11.50 |
| Detroit, auto | 8.00- 8.50 |
| St. Louis, R. R. | 8.50- 9.00 |
| Eastern Pa., R. R. | 11.50-12.50 |

**RAILS FOR ROLLING**

*5 feet and over*

| | |
|---|---|
| Birmingham | 10.50-11.50 |
| Boston, dealers | 7.00- 7.25 |
| Buffalo | 9.00- 9.50 |
| Chicago | 11.00-11.50 |
| Eastern Pa. | 12.50 |
| New York, dealer | 6.50- 7.00 |
| St. Louis | 10.75-11.25 |

**LOCOMOTIVE TIRES**

| | |
|---|---|
| Chicago (cut) | 11.00-11.50 |
| St. Louis, No. 1 | 8.75- 9.25 |

**LOW PHOS. PUNCHINGS**

| | |
|---|---|
| Buffalo | 11.00-11.50 |
| Chicago | 12.50-13.00 |
| Eastern Pa. | 13.50 |
| Pittsburgh | 14.25-14.75 |

# Nonferrous Metal Prices of the Week

*Spot unless otherwise specified. Cents per pound*

| | Copper: Electro., del. Conn. | Copper: Lake, del. Midwest | Copper: Casting, refinery | Straits Tin: New York Spot | Straits Tin: New York Futures | Lead: New York | Lead: East St. L. | Zinc: St. L. | Aluminum: 98-99% | Antimony: Spot, N. Y. | Ingot Nickel |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. 6 | 8.25 | 8.37½ | 8.00 | 52.50 | 53.10 | 4.00 | 3.90 | 4.25 | *22.90 | 7.25 | 35.00 |
| Jan. 8 | 8.25 | 8.37½ | 8.00 | 52.00 | 52.60 | 4.00 | 3.90 | 4.25 | *22.90 | 7.25 | 35.00 |
| Jan. 9 | 8.00 | 8.37½ | 7.75 | 52.00 | 52.60 | 4.00 | 3.90 | 4.25 | *22.90 | 7.25 | 35.00 |
| Jan. 10 | 8.00 | 8.12½ | 7.75 | 52.00 | 52.60 | 4.00 | 3.90 | 4.25 | *22.90 | 7.25 | 35.00 |
| Jan. 11 | 8.00 | 8.12½ | 7.75 | 52.30 | 52.90 | 4.00 | 3.90 | 4.25 | *22.90 | 7.25 | 35.00 |
| Jan. 12 | 8.00 | 8.12½ | 7.75 | 52.00 | 52.60 | 4.00 | 3.90 | 4.25 | *22.90 | 7.25 | 35.00 |

*Nominal quotation. Market range 19.90c to 22.90c.

# Warehouse Iron and Steel Prices

*Cents per pound for delivery within metropolitan districts of cities specified*

| STEEL BARS | |
|---|---|
| Baltimore* .. | 2.75c |
| Boston†† ..... | 2.90c |
| Buffalo ..... | 2.95c |
| Chattanooga.. | 3.26c |
| Chicago ..... | 2.90c |
| Cincinnati .... | 3.10c |
| Cleveland ..... | 2.90c |
| Detroit ..... | 2.98½c |
| Houston ..... | 3.00c |
| Los Angeles.. | 3.40c |
| New Orleans | 3.00c |
| New York‡(d) | 3.17c |
| Pittsburgh .... | 2.85c |
| Philadelphia* | 2.75c |
| San Francisco | 3.55c |
| Seattle ..... | 3.40c |
| St. Louis ..... | 3.14c |
| St. Paul ..... | 3.00c |
| Tulsa ..... | 3.25c |

| IRON BARS | |
|---|---|
| Portland ..... | 3.40c |
| San. Fran. .... | 3.55c |
| Baltimore* .... | 2.75c |
| Baltimore* ... | 2.60c |
| Chattanooga.. | 3.26c |
| Chicago ..... | 2.75c |
| Cincinnati .... | 3.10c |
| Detroit ..... | 2.98½c |
| New York‡(d) | 3.10c |
| Philadelphia* | 2.75c |
| St. Louis ..... | 3.14c |
| Tulsa ..... | 3.25c |

| REINFORC. BARS | |
|---|---|
| Boston .....2.75c-3.25c | |
| Buffalo ..... | 1.95c |
| Chattanooga.. | 3.26c |
| Chicago .....1.95c-2.10c | |
| Cleveland (c) | 1.97½c |
| Cincinnati .... | 3.10c |
| Houston ..... | 3.00c |
| Los Ang., cl... | 3.10c |
| New Orleans | 3.00c |
| New York .... | 3.17c |
| Philadelphia.. | 2.62½c |
| Pitts., plain... | 3.00c |
| Pitts., twisted squares .... | 3.12½c |
| Seattle ..... | 3.50c |
| St. Louis ..... | 3.29c |
| Tulsa ..... | 3.25c |
| Young. .....2.30c-2.60c | |

| SHAPES | |
|---|---|
| Baltimore* ... | 2.60c |
| Boston†† ..... | 3.07c |
| Buffalo ..... | 3.20c |
| Chattanooga.. | 3.46c |
| Chicago ..... | 3.10c |
| Cincinnati .... | 3.30c |
| Cleveland ..... | 3.21c |
| Detroit ..... | 3.30c |
| Houston ..... | 3.00c |
| Los Angeles.. | 3.40c |
| New Orleans | 3.50c |
| New York(d) | 3.27c |
| Philadelphia* | 2.75c |
| Pittsburgh .... | 3.05c |
| Portland ..... | 3.40c |
| San Francisco | 3.50c |
| Seattle ..... | 3.40c |
| St. Louis ..... | 3.34c |
| St. Paul ..... | 3.25c |
| Tulsa ..... | 3.50c |

| PLATES | |
|---|---|
| Baltimore* .... | 2.75c |
| Boston†† ..... | 3.08c |
| Buffalo ..... | 3.20c |
| Chattanooga.. | 3.46c |
| Chicago ..... | 3.10c |
| Cincinnati .... | 3.30c |
| Cleveland, ¼ in. and thicker. ..... | 3.21c |
| Cleve., ⅜-in. | 3.20c |
| Detroit ..... | 3.30c |
| Det., ⅛-in..... | 3.10c |
| Houston ..... | 3.00c |
| Los Angeles.. | 3.40c |
| New Orleans | 3.50c |
| New York(d) | 3.30c |
| Philadelphia* | 2.75c |
| Phila. floor.... | 4.35c |
| Pittsburgh .... | 3.05c |
| Portland ..... | 3.40c |
| San Fran. .... | 3.50c |
| Seattle ..... | 3.40c |
| St. Louis ..... | 3.34c |
| St. Paul ..... | 3.25c |
| Tulsa ..... | 3.50c |

| NO. 10 BLUE | |
|---|---|
| Baltimore* .. | 2.95c |
| Boston†† ..... | 2.90c |
| Buffalo ..... | 3.10c |
| Chattanooga.. | 3.26c |
| Chicago ..... | 2.95c |
| Cincinnati .... | 3.10c |
| Cleveland ..... | 3.01c |
| Det., 8-10 ga. | 3.03½c |
| Houston ..... | 3.60c |
| Los Angeles.. | 3.65c |
| New Orleans | 3.50c |
| New York .... | 3.17c |
| Portland ..... | 3.65c |
| Philadelphia* | 2.95c |
| Pittsburgh .... | 2.85c |
| San Fran. .... | 3.75c |
| Seattle ..... | 3.65c |
| St. Louis ....3.19c-3.36c | |
| St. Paul ..... | 3.45c |
| Tulsa ..... | 3 70c |

| NO. 24 BLACK | |
|---|---|
| Baltimore*†.. | 3.50c |
| Boston†† ..... | 3.75c |
| Buffalo ..... | 3.25c |
| Chattanooga.. | 4.01c |
| Chicago ..... | 3.70c |
| Cincinnati .... | 3.85c |
| Cleveland ..... | 3.76c |
| Detroit ..... | 3.78½c |
| Los Angeles.. | 4.15c |
| New York .... | 3.65c |
| Philadelphia*† | 3.40c |
| Pittsburgh .... | 3.35c |
| Portland ..... | 4.25c |
| San Fran. .... | 4.25c |
| Seattle ..... | 4.25c |
| St. Louis ..... | 3.94c |
| St. Paul ..... | 3.695c |
| Tulsa ..... | 4.75c |

| NO. 24 GAL. SHEETS | |
|---|---|
| Baltimore*†.. | 3.75c |
| Buffalo ..... | 4.00c |
| Boston ..... | 4.60c |
| Chattanooga.. | 4.61c |
| Chicago .....4.20c-4.30c | |
| Cincinnati .... | 4.45c |
| Cleveland ..... | 4.36c |
| Detroit ..... | 4.45c |
| Houston ..... | 3.57c |
| Los Angeles.. | 4.75c |
| New Orleans | 4.35c |
| New York .... | 4.25c |
| Pitts.** .....3.90c-4.20c | |
| Portland ..... | 4.85c |
| San Fran. .... | 4.85c |
| Seattle ..... | 4.85c |
| St. Louis ..... | 4.54c |
| St. Paul ..... | 4.19c |
| Tulsa ..... | 5.10c |
| Phila.*† ..... | 4.00c |

| BANDS | |
|---|---|
| Baltimore .... | 3.05c |
| Boston†† ..... | 3.15c |
| Buffalo ..... | 3.30c |
| Chattanooga.. | 3.71c |
| Chicago ..... | 3 20c |
| Cincinnati .... | 3.35c |
| Cleveland ..... | 3.26c |
| Detroit, ⅛-in. and lighter | 3.28½c |
| Houston ..... | 3.25c |
| Los Angeles.. | 3.80c |
| New Orleans | 3.20c |
| New York(d) | 3.42c |
| Philadelphia.. | 3.05c |
| Pittsburgh .... | 3.10c |
| Portland ..... | 3.90c |
| San Fran. .... | 3.15c |
| Seattle ..... | 3.90c |
| St. Paul ..... | 3.20c |
| Tulsa ..... | 3.45c |
| St. Louis ..... | 3.44c |

| HOOPS | |
|---|---|
| Baltimore .... | 2.80c |
| Boston ..... | 4.15c |
| Buffalo ..... | 2.55c |
| Chicago ..... | 3.20c |
| Cincinnati .... | 3.35c |
| Det., No. 14 and lighter | 3.28½c |
| New York .... | 3.42c |
| Philadelphia.. | 3.30c |
| Pittsburgh .... | 3.75c |
| Seattle ..... | 5.40c |
| St. Paul ..... | 3.75c |

| COLD FIN. STEEL | |
|---|---|
| Baltimore (c) | 3.56c |
| Boston .....3.83c-4.33c | |
| Buffalo ..... | 3.25c |
| Chattanooga* | 3.91c |
| Chicago ..... | 3.50c |
| Cincinnati .... | 3.70c |
| Cleveland ..... | 3.40c |
| Detroit ..... | 3.40c |
| Los Ang.(f).. | 5.95c |
| New Orleans | 4.25c |
| New York...3.92c-4.42c | |
| Philadelphia.. | 3.73c |
| Pittsburgh ..3.35c-3.45c | |
| Portland (f).. | 4.75c |
| San Fran. (f) | 5.95c |
| Seattle (f).... | 4.75c |
| St. Paul ..... | 3.20c |
| St. Louis..... | 3.74c |
| Tulsa ..... | 4.65c |

| COLD ROLL. STRIP | |
|---|---|
| Boston, 0.100-in., 500 lb. lots ..... | 5.20c |
| Buffalo ..... | 5.25c |
| Chicago (b).. | 5.65c |
| Cincinnati .... | 5.80c |
| Cleveland (b) | 5.55c |
| Detroit ..... | 5.40c |
| Philadelphia.. | 4.55c |
| New York..... | 4.55c |
| St. Louis ..... | 5.74c |

(b) Net base, straightening, cutting, boxing, 1 ton or more.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff.

(e) New mill classif.

(f) Rounds only.

‡Domestic bars.

*Plus. quan. extras.

**Under 25 bundles.

*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

# Current Iron and Steel Prices of Europe

**Dollars at Rates of Exchange, Jan. 11**

## Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

| | British gross tons U. K. ports £ s d | | Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d | |
|---|---|---|---|---|
| **PIG IRON** | | | | |
| Foundry, 2.50-3.00 Silicon. | $14.89 | 2 18 6 | $8.88 | 1 16 6 |
| Basic bessemer..... | 13.74 | 2 14 0* | 7.30 | 1 10 0 |
| Hematite, Phos. .03-.05.... | 15.27 | 3 0 0 | .... | ..... |
| **SEMIFINISHED STEEL** | | | | |
| Billets..... | $28.00 | 5 10 0 | $11.44 | 2 7 0 |
| Wire rods, No. 5 gage..... | 39.70 | 7 16 0 | 21.90 | 4 10 0 |
| **FINISHED STEEL** | | | | |
| Standard rails..... | $39.45 | 7 15 0 | $26.77 | 5 10 0 |
| Merchant bars..... | 1.59c | 7 0 0 | .69c | 3 2 6 |
| Structural shapes..... | 1.67c | 7 7 6 | .63c | 2 17 6 |
| Plates, †¼ in. or 5 mm..... | 1.82c | 8 0 0 | .89c | 4 1 0 |
| Sheets, black, 24 gage or 0.5 mm..... | 2.10c | 9 5 0 | 1.27c | 5 15 0 |
| Sheets, gal., 24 gage, corr... | 2.55c | 11 5 0 | 1.65c | 7 10 0 |
| Bands and strips..... | 1.82c | 8 0 0 | .85c | 3 17 6 |
| Plain wire, base..... | 2.10c | 9 5 0 | 1.18c | 5 7 6 |
| Galvanized wire, base..... | 2.50c | 11 0 0 | 1.38c to 1.40c | 6 5 6 to 6 7 6 |
| Wire nails, base..... | 2.72c | 12 0 0 | 1.27c | 5 15 0 |
| Tin plate, box 108 lbs..... | $ 4.20 | 0 16 6 | .... | ..... |

British ferromanganese $82 to $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4(3.74) f.o.b.

## Domestic Prices at Works or Furnace—Last Reported

| | £ s d | | French Francs | | Belgian Francs | | Reich Marks |
|---|---|---|---|---|---|---|---|
| Fdy. pig iron, Si. 2.5..... | $15.91 | 3 2 6(a) | $13.14 | 215 | $13.27 | 305 | $23.44 | 63 |
| Basic bessemer pig iron.... | 16.54 | 3 5 0(a)* | 11.30 | 185 | 12.62 | 290 | 25.85 | 69.50 |
| Furnace coke..... | 4.07 | 0 16 0 | 7.33 | 120 | 4.79 | 110 | 7.16 | 19.25 |
| Billets..... | 28.00 | 5 10 0 | 24.75 | 405 | 19.14 | 440 | 35.89 | 96.50 |
| Standard rails..... | 1.87c | 8 5 0 | 1.96c | 700 | 2.20c | 1,100(b) | 2.23c | 132 |
| Merchant bars..... | 1.73c | 7 12 6 | 1.57c | 560 | 1.07c | 535 | 1.86c | 110 |
| Structural shapes..... | 1.99c | 8 15 0 | 1.54c | 550 | 1.07c | 535 | 1.82c | 107.50 |
| Plates, †¼-in. or 5 mm..... | 1.93c | 8 10 0 | 1.90c | 680 | 1.35c | 675 | 2.15c | 127 |
| Sheets, black..... | 2.33c | 10 5 0§ | 2.38c | 850‡ | 1.50c | 750‡ | 2.43c | 144‡ |
| Sheets, galv., corr., 24 ga. or 0.5 mm..... | 2.89c | 12 15 0 | 4.06c | 1,450 | 3.00c | 1,500 | 6.25c | 370 |
| Plain wire..... | 2.10c | 9 5 0 | 3.16c | 1,130 | 2.20c | 1,100 | 2.99c | 177 |
| Bands and strips..... | 2.38c | 10 10 0 | 1.82c | 650 | 1.40c | 700 | 2.15c | 127 |

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b Since January.

# Bars

**Bar Prices, Page 32**

Soft steel bar sales and specifications are slow to increase, the recent volume showing little change compared with that of the first week of the month. Producers anticipate that consumption of material shipped during January will be sufficiently advanced to permit increased buying late this month.

Slowness with which some automotive interests are increasing production also is retarding bar demand at Chicago. Consumption among miscellaneous consumers gradually is increasing. Soft steel bars continue 1.80c, Chicago, with rail steel 1.70c, Chicago, and bar iron 1.60c, Terre Haute, Ind.

Base prices on merchant steel and rail steel bars for manufacturing hold firmly at 1.75c, and 1.65c, Pittsburgh, respectively, but the bar market reflects little activity. Alloy bars are firm at 2.45c base, Pittsburgh, but buyers have released little first quarter tonnage.

Automotive orders for steel bars have improved at Cleveland. These and miscellaneous requirements booked so far this month are larger than in the comparable period last month.

Buying of commercial steel bars in New England at 1.75c, Pittsburgh, has been heavier than expected, notably from textile machinery builders. Miscellaneous spot buying has picked up.

Impending railroad buying in eastern Pennsylvania is relied on to give better buying of steel bars. The market is dull.

# Plates

**Plate Prices, Page 32**

Plate orders generally are of a miscellaneous character. Improved demand for railroad equipment has yet to materialize, with a substantial volume of business for this purpose in prospect.

Tank work continues slow at Chicago and inquiries from oil companies usually are small. Plates continue 1.75c, Chicago.

A 375-ton steel barge, 195 x 40 x 12 feet, which Dravo Contracting Co., Pittsburgh, closed on last week, will be electric welded throughout at the company's Neville Island yards and then shipped to the Wilmington, Del., yards of the company for erection. Barge is for the movement of gasoline by the Seaboard Shipping Corp., New York.

Other pending river work includes plates for ten 46 x 22 x 2½ foot steel pontoons and two large dredges for federal engineers at Kansas City, Mo., engineers, Feb. 2, a dredge boat for Vicksburg, Miss., about 100 tons, and miscellaneous repair work for Cincinnati, Vicksburgh and Kansas City engineers' offices.

Tank work is slow but railroad plate orders are materializing at Pittsburgh. Steel plate girder spans and miscellaneous requirements for plates make a slightly more active market. Crucible Steel Co. is now rolling a tonnage of nickel steel plates at its Pittsburgh works for use in dam No. 5 on the Mississippi river near Minneiska, Minn. Tank work at Barnesville, O., 250 tons, and at East Greenville, Pa., 125 tons, is still open.

Plate specifications are heavier with prices firm at 1.80c, Coatesville, Pa., and all extras firmly applied. Most industrial users will take more plates this quarter. Several standpipe and water tank projects are up for early bids.

Prospective railroad requirements dominate the plate market in eastern Pennsylvania with miscellaneous demand expanding slowly. Some leading platemakers expect an advance of at least $2 per ton in the near future. New York Shipbuilding Co., Camden, N. J., has divided 11,400 tons of plates, shapes and bars between Bethlehem Steel Co., Bethlehem, Pa., and Carnegie Steel Co., Pittsburgh. This is for two tankers for Standard Vacuum Transportation Co., New York.

Miscellaneous buying in small lots makes up a moderate tonnage booked by plate mills at Cleveland.

## Contracts Placed

11,400 tons, New York Shipbuilding Co., Camden, N. J., to Bethlehem Steel Co., Bethlehem, Pa., and Carnegie Steel Co., Pittsburgh; for two tankers for Standard Vacuum Transportation Co., New York; includes shapes and bars.

375 tons, one non-propeller steel tank barge for movement of gasoline for Seaboard Shipping Corp., New York, to Dravo Contracting Co., Neville Island, Pittsburgh.

250 tons, fuel oil tanks, Pearl Harbor, T. H., to Industrial Piping & Engineering Co., Baltimore.

## Contracts Pending

5280 tons, armor plate, bureau of ordnance, navy department, Washington; low bids: Midvale Co., 1767 tons at $852,019; Bethlehem Steel Co., 2360 tons at $1,148,280; Carnegie Steel Co., 1153 tons at $637,380, bids Jan. 3.

3700 tons, 28-inch dredge pipe for Fort Peck project on Missouri river; bids Feb. 3, war department, Washington.

750 tons, two coast guard cutters for Pacific waters, to Charleston navy yard, Charleston, S. C.

340 tons, curb plates, Manhattan-Weehawken, N. J., Hudson river tunnel shafts; bids Feb. 6.

170 tons, water storage tanks, Lexington and Norfolk, Mass.

150 tons, steel water reservoir, Parsons, W. Va.

110 tons, 24-inch welded steel pipe, Inglewood, Calif.; Western Pipe & Steel Co., Los Angeles, low.

100 tons, 250,000-gallon elevated tank, Gretna, La.; loan approved

100 tons, gasoline storage system, Hamilton Field, California; bids opened.

Unstated tonnage, 10 pontoons, each 46 x 22 x 2½ feet, for Kansas City army engineers, bids Feb. 2.

Unstated tonnage, two superside-wheel dredges, each 277 x 84 x 8½ feet for Kansas City army engineers, bids Feb. 2.

Unstated tonnage, 250,000-gallon elevated water tank, Kaukauna, Wis.; bids Jan. 12.

Unstated tonnage, 100,000-gallon steel tank on 100-foot tower, Cherokee, Ala.

Unstated tonnage, 100,000-gallon steel tank on 100-foot tower, Courtland, Ala.

Unstated tonnage, 200,000-gallon elevated water tank, Ashland City, Tenn.

Unstated tonnage, 150,000-gallon elevated water tank, Hearne, Tex.; loan approved.

# Wire

**Wire Prices, Page 33**

Small spot orders for wire products rule as users are well stocked. Although basing prices on wire products are firm, report is heard of possible failure to observe fully all extras on plain wire.

Wire demand at Chicago has declined less than had been anticipated, although both shipments and incoming business are quieter than in December. Automotive interests delay placing large orders but these are anticipated as soon as difficulties in commencing heavier production are overcome.

Cleveland wire interests are experiencing a reaction from the heavy shipments in December, and the market is quiet. Nut and bolt manufacturers, however, are early prospects for heavier tonnage, shipments to automotive interests having increased substantially. Reports from southern states indicate improved business in wire and wire products, buying power in agricultural districts being notably better.

Wire drawing operations in New England are slower, but the drop following heavy specifications at the close of last quarter, has been less than expected. Plain wire is firm at 2.30c, Worcester, Mass.

# Shapes

**Structural Shape Prices, Page 32**

A heavier tonnage of shape awards for the week includes several substantial lots for industrial buildings, though public work accounts for practically all pending projects of importance in the New York metropolitan area.

Bridges lead structural steel awards in New England, including two Massachusetts state projects, while the American Bridge Co. will fabricate close to 12,000 tons for the two highway spans over the Cape Cod canal. The railroad lift bridge superstructure over the canal is expected up for bids in about a month, taking several thousand tons.

Award of two contracts requiring a total of 1850 tons features the market at Philadelphia. For the Philadelphia approach to the Delaware river bridge speed line 1000 tons are up for bids Jan. 15, and approximately 3000 tons for the Camden approach are expected up March 15.

Chicago reports approaching completion of bids on locks for the Mississippi river will leave fabricators with only small lots to figure. While more than 50,000 tons of structural shapes, it is estimated, will be required for dams to accompany locks now under construction, this work is not expected to be started for about a year.

New inquiries include 2000 tons for a Montana river bridge and 1850 tons for a Colorado dam.

The market at Pittsburgh is more active, awards having been made on the 1300-ton St. Albans, W. Va., bridge, and inquiry now revived for the Pittsburgh postoffice ramps to take 1200 tons. Plain material prices continue firm.

Interest at Cleveland centers on 1750 tons of piling for the Huron, O., breakwater, for which bids were taken Jan. 10 and forwarded to Washington. Bids on harbor improvements at Fairport, O., requiring 1400 tons were rejected and the project is to be readvertised. Necessity for sending bids on all public works projects to Washington for approval tends to retard awards.

## Contracts Placed

12,000 tons, two highway bridges, Cape Cod canal, Bourne and Sagamore, Mass., to American Bridge Co., Pittsburgh, Pa.

1500 tons, building for Calco Chemical Co., Bound Brook, N. J., to Harris Structural Steel Co., New York.

1300 tons, state bridge, St. Albans, W. Va., to McClintic-Marshall Corp., Bethlehem, Pa.

1200 tons, lock No. 12, Burlington, Iowa, to R. C. Mahon Co., Detroit; W. C. Maxon Co., Dayton, O., general contractor.

1100 tons, shapes, lock No. 9, Mississippi river, Lynxville, Wis., to McClintic-Marshall Corp., Bethlehem, Pa.; Walter W. Magee Co., St. Paul, Minn., general contractor. This is in addition to 2500 tons of piling announced in STEEL, Jan. 1.

1100 tons, Elkhorn river bridge, Waterloo, Nebr., to Omaha Steel Works, Omaha, Nebr.

1100 tons, building for Celenese Corp., Ancelle, Md., to McClintic-Marshall Corp., Bethlehem, Pa.

750 tons, foundation for addition to Library of Congress, Washington, to McClintic-Marshall Corp., Bethlehem, Pa.; through John McShain, Philadelphia.

750 tons, drawbridge, Mystic river, Medford, Mass., to Boston Bridge Works, Cambridge, Mass.; Coleman Bros. Corp., Boston, general contractor

750 tons, cableway towers, Norris dam, Tennessee Valley Authority, to Virginia Bridge & Iron Co., Roanoke, Va.

600 tons, unit B, Martha mills, Textile division, B. F. Goodrich Rubber Co., Thomasville, Ga., to Virginia Bridge & Iron Co., Roanoke, Va.; Batson-Cook, West Point, Ga., general contractor.

550 tons, potash plant, Loving, N. Mex., for American Potash & Chemical Corp., to Virginia Bridge & Iron Co., Roanoke, Va.

500 tons, stadium, Columbia, S. C., to Virginia Bridge & Iron Co., Roanoke, Va.

465 tons, hangars, Quantico, Va., to Ingalls Iron Works Co., Birmingham, Ala.

450 tons, bridge, Burlington, Kans., to St. Joseph Structural Steel Co., St. Joseph, Mo.

390 tons, bridge, Milk river, near Wiota, Montana, federal project; 300 tons to American Bridge Co., Pittsburgh; 90 tons sheet piling to Carnegie Steel Co., Pittsburgh; Minneapolis Bridge Co., general contractor.

350 tons, state bridge, Graylock-Braytonville., Mass., to McClintic-Marshall Corp., Bethlehem, Pa.; C. B. Lindholm, Pittsfield, Mass., general contractor.

315 tons, superstructure pier No. 1, Fort Mason, Calif., to Ingalls Iron Works Co., Birmingham, Ala.

260 tons, state highway bridge, Georgia, to Virginia Bridge & Iron Co., Roanoke, Va.

225 tons, sewage disposal plant, Baltimore, to Dietrich Bros., Baltimore.

200 tons, two 10-ton hammerhead cranes, specification 7540, Mare Island, Calif., to Lakeside Bridge & Steel Co., Milwaukee.

200 tons, building, Tonawanda, N. Y., for Eastern States Milling Co., to Buffalo Structural Steel Co., Buffalo.

200 tons, brewery building for Hammenschmidt Brewing Co., St. Paul, to St. Paul Foundry Co., St. Paul.

175 tons, Missouri highway bridges, to St. Joseph Structural Steel Co., St. Joseph, Mo.

160 tons, subway for Southern Pacific railroad at El Monte, Calif., to unnamed interest.

160 tons, shed, Ruberoid Co., Bound Brook, N. J., to McClintic-Marshall Corp., Bethlehem, Pa.; Wigton-Abbott Co., general contractor.

151 tons, shapes and bars, state highway bridges, Le Flore county, Mississippi; 91 tons of shapes to Virginia Bridge & Iron Co., Roanoke, Va.; 60 tons of bars to Jones & Laughlin Steel Corp., Pittsburgh; E. O. Koremo Construction Co., Memphis, Tenn., general contractor.

150 tons, swimming pool, Salem, Mass., CWA project, to Carnegie Steel Co., Pittsburgh.

130 tons, plate girder state bridge, Stoughton, Mass., to Boston Bridge Works, Cambridge, Mass.; Arute Bros., Bridgewater, Mass., general contractors.

126 tons, Tongue river bridge, Sheridan county, Wyoming, to unnamed interest.

125 tons, viaduct, Beta, Colo., to American Bridge Co., Pittsburgh.

110 tons, city hall, Signal Hill, Calif., to McClintic-Marshall Corp., Los Angeles.

110 tons, state highway bridge, Warwasing, N. Y., to American Bridge Co., Pittsburgh.

100 tons, underpass, Fratt, Tex., to Virginia Bridge & Iron Co., Roanoke, Va.

100 tons, bridge, Morrison, Colo., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

100 tons, shapes and bars, railroad crossing and approaches, Loveland, Colo., to Virginia Bridge & Iron Co., and Colorado Fuel & Iron Co.; M. E. Carlson, Denver, general contractor.

100 tons or more, shapes and bars, officers' quarters, Fort Bliss, Tex., to Darbyshire-Harvie Co., El Paso; Robert E. McKee, El Paso, general contractor.

100 tons, shapes and junior beams, dormitory, state hospital, Concord, N. H., to Lyons Iron Works, Manchester, N. H., and Jones & Laughlin Steel Corp., Pittsburgh.

100 tons, shapes and bars, state bridge, Hillsborough river, Florida; 73 tons of shapes to Aetna Iron & Steel Co., Jacksonville, Fla.; 27 tons of bars to Truscon Steel Co., Youngstown.

## Shape Awards Compared

| | Tons |
|---|---|
| **Week ended Jan. 13** | **28,252** |
| **Week ended Jan. 6** | **14,961** |
| **Week ended Dec. 30** | **13,417** |
| **This week in 1933** | **6,283** |
| **Weekly average for 1933** | **15,413** |
| **Weekly average 1934** | **21,606** |
| **Weekly average, Dec.** | **22,058** |
| **Total to date 1933** | **14,248** |
| **Total to date 1934** | **43,213** |

## Contracts Pending

4500 tons, Manhattan-Weehawken, N. J., Hudson river tunnel shafts; bids Feb. 6.

3370 tons, tunnel and shafts, Port of New York authority, New York-Weehawken, N. J., tunnel.

3500 tons, steel and structural piling, bulkhead, Government island, Oakland, Calif.; bids opened.

2650 tons, including 1450 tons piling, lock No. 12, Bellevue, Iowa; bids Jan. 23 to United States engineer, Rock Island, Ill.

2600 tons, including 1400 tons piling, lock No. 10, Guttenberg, Iowa; bids Jan. 30 to United States engineer, Rock Island, Ill.

2500 tons, roller crest dam, Montgom-

ery island, Ohio river, below Pittsburgh, Booth & Flinn Co., Pittsburgh, awarded general contract.

2000 tons, Montana river railroad bridge, Wiota, Mont.; bids Jan. 25 to United States engineer, Kansas City, Mo.

1850 tons, dam, Castlewood, Colo.

1400 tons, piling, Fairport, O., harbor improvement; bids rejected, and to be readvertised.

1200 tons, postoffice ramps, Pittsburgh; revived bids Jan. 19 to treasury department, Washington.

1200 tons, lock No. 18, Mississippi river near Burlington, Iowa; Maxon Construction Co., Dayton O. low at $1,344,429. Army engineers' estimate, $1,390,571.

1040 tons, Calvert street bridge, Washington.

1000 tons, foundations, parcel post building, Boston.

400 tons, Owyhee river project, Dunaway, Oreg.; bids Jan. 15 to bureau of reclamation, Denver.

400 tons, piling, substructure, Fore river bridge, Quincy-Weymouth, Mass.

400 tons, building, Battle Creek, Mich.

400 tons, Illinois highway bridges.

380 tons, Russian river bridge at Monto Rio for Santa Rosa county, California; bids rejected.

280 tons, lookout towers at various locations, for department of agriculture, Washington.

278 tons, Ell river bridge, Humboldt county, California; Neves & Sharp, Santa Clara, Calif., low for general contract.

260 tons, bridges, Pushmataha county, Oklahoma; bids Jan. 16.

212 tons, bridges, Pottawatomie county, Oklahoma; bids Jan. 16.

210 tons, through truss bridge, Slippery Rock township, Lawrence county, Pennsylvania; Clyde L. Moore, Lowellville, O., general contractor, bids of Jan. 5.

200 tons, bridge for Missouri Pacific railroad, Selkirk, Ind.

187 tons, Ohio bridge projects; bids to department of highways, Columbus, Jan. 19 and 20.

160 tons, bridge, Latimer county, Oklahoma; bids Jan. 16.

150 tons, addition to Golden West Brewery, Oakland, Calif.; bids opened.

Unstated tonnage, 20 sets of officers' headquarters, Fort Humphreys, Virginia; R. B. McDaniel Co., New Brighton, Pa., low on general contract at $272,358.

# Reinforcing

**Reinforcing Bar Prices, Page 33**

New inquiry for reinforcing steel in the New York district is light. A fair volume of small lot buying is being done. Two projects at Washington, taking 1250 tons, lead awards in the East.

At Chicago orders and inquiries are in about their former volume and number, and almost entirely for state and federal work. For a state hospital at Manteno, Ill., 600 tons have been placed. Mississippi river locks on which bids have yet to be taken require about 2000 tons. Prices at Chicago continue 1.95c for cut lengths of billet bars, and 1.80c for rail steel.

A substantial tonnage still is pending in New England, despite fairly active buying during the past fortnight. The Fore river bridge substructure, Quincy - Weymouth, Mass., on which bids are in, takes 500 tons.

Leading present inquiries at Pittsburgh are about 500 tons for the postoffice ramps, that city, on which revived bids will close Jan. 19, about 500 tons for the Montgomery island roller crest dam, and 500 tons for the Burlington, Iowa, river lock. Prices of new billet steel for reinforcing purposes hold at 1.80c, Pittsburgh, for mill lengths; and rail steel, 1.75c.

The largest reinforcing steel tonnage this year, 3600 tons for a spillway bridge at Bonnet Carre, La., has been placed with a St. Louis fabricator.

## Contracts Placed

3600 tons, spillway bridge, Bonnet Carre, St. Charles parish, La., to Laclede Steel Co., St. Louis; Kelliher Construction Co., Dallas, Tex., general contractor. Jones & Laughlin Steel Corp., Pittsburgh, awarded 80 tons of structural steel.

800 tons, foundation, addition, Library of Congress, Washington, to American Steel Engineering Co., Philadelphia; John McShain, Philadelphia, general contractor.

650 tons, mooring at Pearl Harbor, T. H., specification 7093, to Pacific Coast Steel Corp., San Francisco.

600 tons, state hospital, Manteno, Ill., to Concrete Engineering Co., Chicago.

500 tons, estimated, buildings, roads and utilities, Veterans' hospital, Roanoke, Va., to Knoxville Iron Co., Knoxville, Tenn.; Algernon Blair, Montgomery, Ala., general contractor. Miscellaneous and ornamental iron to Roanoke Iron Works Inc.

450 tons, receiving building, St. Elizabeth's hospital, Washington, to Penn Steel Service Co., Philadelphia; Ralph S. Herzog & Co., Philadelphia, general contractor.

425 tons, lock No. 9, Mississippi river, Lynxville, Wis., to Kalman Steel Corp., Bethlehem, Pa.; Walter W. McGee Co., St. Paul, Minn., general contractor.

394 tons, specification 23040-A, Boulder Dam, Boulder City, Nev., to Inland Steel Co., Chicago.

355 tons, extension to pier No. 1, Fort Mason, California, to W. S. Wetenhall Co., San Francisco.

340 tons, barracks, Fort Sill, Oklahoma, to Laclede Steel Co., St. Louis; Murch Bros. Construction Co., St. Louis, general contractors.

270 tons, reservoir, Diamond Head, T. H., to unnamed interest.

250 tons, highway, Stoughton-Easton, Mass., to Northern Steel Co., Boston; C. Bianchi & Co., general contractors.

200 tons, highway, East Hartford-Springfield road, Connecticut state project, to Wheeling Steel Corp., Wheeling, W. Va.; Daniel O'Connell & Sons Co., Holyoke, Mass., general contractor.

125 tons, class room building, Howard University, Washington, to Concrete Steel Co., New York; Consolidated Engineering Co., Baltimore, general contractor.

100 tons, noncommissioned officers' quarters, Hamilton Field, California, to Gunn, Carle & Co., San Francisco.

100 tons, bridge, Graylock-Braytonville, Mass., to Kalman Steel Corp., Bethlehem, Pa.; C. B. Lindholm, Pittsfield, Mass., general contractor.

100 tons, bars and mesh, passenger station, Atchison, Topeka & Santa Fe railroad, Oklahoma City, Okla., to J. B. Klein Iron & Foundry Co., and Capitol Steel Co., Oklahoma City; F. M. Spencer & Son, Topeka, Kan.; general contractor.

100 tons, highway structures, Suffolk county, New York, to Joseph T. Ryerson & Son Inc., New York.

## Concrete Awards Compared

| | Tons |
|---|---|
| **Week ended Jan. 13** | **9,359** |
| **Week ended Jan. 6** | **3,257** |
| **Week ended Dec. 30** | **3,648** |
| **This week in 1933** | **3,819** |
| **Weekly average for 1933** | **3,771** |
| **Weekly average, 1934** | **6,308** |
| **Weekly average, Dec.** | **5,283** |
| **Total to date 1933** | **10,686** |
| **Total to date 1934** | **12,616** |

## Contracts Pending

1000 tons, Manhattan-Weehawken, N. J., Hudson river tunnel shafts; bids Feb. 6.

550 tons, lock No. 12, Bellevue, Iowa; bids Jan. 23 to United States engineer, Rock Island, Ill.

500 tons, lock No. 18, Mississippi river near Burlington, Iowa; Maxon Construction Co., Dayton, O., low on general contract.

500 tons, Montgomery island roller crest dam near Pittsburgh; Booth & Flinn Co., Pittsburgh, general contractor.

500 tons, postoffice ramps, Pittsburgh; revived bids Jan. 19 to treasurer department, Washington.

440 tons, easterly approach, San Francisco-Oakland bridge; Clinton Construction Co., San Francisco, low.

400 tons, mausoleum, Lawndale, San Mateo county, California; bids soon.

250 tons, highway, Clifton Park-Crescent, Saratoga county, New York, to be readvertised Jan. 26.

250 tons, retail store, Sears, Roebuck & Co., Chicago.

200 tons, Owyhee river project, Dunaway, Oreg.; bids Jan. 15, bureau of reclamation, Denver.

125 tons, state highway bridge, Gogebic, Mich.; bids Jan. 12.

120 tons, Ohio highway projects; bids to department of highways, Columbus, Jan. 19 and 20.

118 tons, state highway work in Tulare county, California; bids Jan. 24.

106 tons, two state bridges in Los Angeles county, California; bids Jan. 24.

105 tons, Ramona boulevard and Marengo street bridge, Los Angeles; bids Jan. 24.

100 tons, foundations, parcel post building, Boston.

# Railroads

**Track Material Prices, Page 33**

Delay in approving the carbuilders' code is holding up placing of railroad cars now on inquiry by a number of roads, to be financed by PWA. Opening of bids on freight car inquiries by Van Sweringen roads scheduled for Jan. 15 and coach inquiries scheduled for Jan. 29 seem likely to be postponed. The same is true of the Lehigh & New England bids on 500 freight cars set for early January, which probably will not come up until mid-February. Wages and hours seem the stumbling block to code approval.

Inquiry for heavy tonnages, for the Pennsylvania's equipment program are expected the week of Jan. 15. As opening of bids under the Clayton act comes ten days after the date of issue, indications are that awards will be made in early February.

Its requirements of 5000 box and 1500 open-top cars may take 75,000 tons of steel, but estimates vary. Meanwhile, the Pennsylvania is releasing specifications against material placed recently for 500 box cars and probably will release some rail specifications next week. Early release also is expected of about 40,000 tons of structurals for electrification work. This is largely against old contracts.

Miscellaneous steel requirements of the New York Central, bids Jan. 16, comprise 10,575 tons.

The Reading may soon buy substantial quantities of steel, particularly plates, for continuation of its car repair program, which includes repairs to Jersey Central cars.

Baltimore & Ohio rail requirements appear definitely set at 35,000 tons, with 5000 tons for the Reading and 10,000 tons for other affiliated roads.

Placing of 33,800 tons of rails by the Atchison, Topeka & Santa Fe gives tonnages to Colorado Fuel & Iron Co., Bethlehem Steel Co., Illinois Steel Co. and Inland Steel Co. Missouri Pacific has placed its 25,000 rail requirements, divided between Colorado Fuel & Iron Co., Tennessee Coal, Iron & Railroad Co., Illinois Steel Co. and Inland Steel Co.

St. Louis & San Francisco is reported to be about to place 26,000 tons of rails to be rolled during first half.

Erie railroad has postponed from Jan. 15 to Jan. 22 opening of bids on its recent inquiry for 3775 freight cars, 125 passenger and eight baggage and mail cars. Its rail purchases, amounting to about 30,000 tons, are not expected until early in February. Interest in the market at Cleveland is centered in award of 9000 freight cars by the Chesapeake & Ohio and Nickel Plate, on bids scheduled to be opened Jan. 15. Railroads at Cleveland have placed contracts covering some of their miscellaneous steel requirements for first quarter.

Bangor & Aroostook has bought 1200 tons of track fastenings, distributed to several mills.

## Rail Orders Placed

Atchison, Topeka & Santa Fe, 33,800 tons; 23,000 tons to Colorado Fuel & Iron Co., Denver, Colo.; 6800 tons to Illinois Steel Co., Chicago; 2300 tons to Bethlehem Steel Co., Bethlehem, Pa.; 1700 tons to Inland Steel Co., Chicago; orders for 10,000 tons of fastenings to be placed shortly.

Missouri Pacific, 25,000 tons, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., Inland Steel Co., and Illinois Steel Co., Chicago, Colorado Fuel & Iron Co., Denver.

## Car Orders Pending

Alaskan, 20 hopper-bottom, 50-ton coal cars, inquiry out.

# Pipe

**Pipe Prices, Page 33**

Pipe orders are slow. New bids are expected to be asked on 6500 tons of cast pipe for six small towns near Springfield, Ill., which are grouping requirements, all to be financed by federal loans. Previous bids exceeded the amount of money available for this work.

Approximately 150 tons of railroad boiler tubes will be required by Baldwin Locomotive Works, Eddystone, Pa., for the ten Northern Pacific locomotives recently placed. In addition, about 400 tons of tubes will be required in the 25 Nickel Plate locomotives which will be bought soon.

Award of 25,000 tons of cast pipe, at approximately $750,000, by Mexico City, Mex., and 9000 tons by Vera Cruz, Mex., at $250,000, the latter to two American companies, is expected daily.

About 800 tons of steel casing for caissons will be needed for the Boston parcel post building foundations. Inquiry in the New England district is lighter although the pipe plant at Everett, Mass., has increased operations and has a substantial backlog.

Cast pipe inquiry in the New York district continues to lag. Prices are generally firm at $40, eastern foundry, for standard cast pipe, 6-inch and over.

## Cast Pipe Placed

300 tons, Sandusky, O., to American Cast Iron Pipe Co., Birmingham, Ala.

150 tons, Ashland, O., to James B. Clow & Sons, Chicago.

145 tons, 6 to 8-inch, class 150, Napa, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

100 tons, 4-inch, class 150, Hanford, Calif., to Pacific States Cast Iron Pipe Co., Provo, Utah.

100 tons, 6 and 8-inch monocast, Tumwater, Wash., to American Cast Iron Pipe Co., Birmingham, Ala.

## Cast Pipe Pending

6000 ton, Providence, R. I.; United States Pipe & Foundry Co., Burlington, N. J., low; Builders Iron Co., Providence, low on fittings.

1800 tons, 8, 12 and 16-inch, Washington,; United States Pipe & Foundry Co., Burlington, N. J., low; Rudisill Foundry Co., Anniston, Ala., low on 98 water pipe specials.

1000 ton, mainly 14-inch, St. Johnsbury, Vt.; bids in.

900 tons, 24-inch, Wilmette, Ill.; bids Jan. 23.

260 tons, Hartselle, Ala.

255 tons, Pleasant Grove, Ala., also 75,000-gallon steel tank on 100-foot tower.

170 tons, gate valves and castings, Courtland, Ala.

155 tons, Ashville, Ala., also hydrants, valves and manholes.

150 tons, 4, 6, and 8-inch, Springfield, Ill.; bids Jan. 15. Additional 2250 tons pending.

140 tons, Cerokee, Ala.

117 tons, Town Creek, Ala.

## Steel Pipe Pending

4000 tons, 27,500 lineal feet, 28-inch butt weld, ¾-inch wall, in 12 to 40-foot lengths for army engineers, Kansas City, Mo.; bids Feb. 3.

800 tons, casing for caisson foundations, parcel post building, Boston; C. J. Maney Co. and New England Foundation Co., low, joint bid.

Unstated tonnage, 500 lineal feet, unstated size, for use with two super side-wheel dredges for army engineers, Kansas City, Mo.; bids Feb. 2.

# Sheets

**Sheet Prices, Page 32**

Automotive sheet demand is expanding rapidly despite slowness in motor car assemblies. While considerable sheet tonnages remained on hand Jan. 1, this material is estimated as sufficient to accommodate only January production and heavier schedules are planned for February. Sheet producers are benefiting from the wide fenders on new cars which largely eliminates the use of strip.

Miscellaneous sheet buyers also

are more active. Farm implement manufacturers are increasing schedules slowly and sheet needs are limited. First quarter contracting at Chicago is fairly well advanced, with consumers taking advantage of unchanged prices to cover needs over the first three months.

At Pittsburgh miscellaneous demand for sheets is spread about evenly between common and full-finished grades. More tonnage is in prospect than immediately at hand. Prices are firmer.

Automotive buying is the chief support to production schedules at 30 per cent in the Cincinnati district. Producers and distributors at St. Louis report a slight gain in orders.

At Boston the New York, New Haven & Hartford railroad is ordering out a substantial tonnage of several finishes. Container and small tank manufacturers are fairly active.

Philadelphia reports a shortage of wide sheets is expected to develop when automotive buying gets under way.

General Motors units, Chrysler and Ford have placed some substantial orders for rush shipment with Cleveland interests. Individual specifications from some of these buyers during the week ran as high as 500 tons. Operations at lake mills increased. Purchases by refrigerator manufacturers also have improved.

New York reports inventories at consuming plants practically completed and early improvement expected.

# Strip Steel

**Strip Prices, Page 33**

First quarter contracting by strip steel buyers has not been general, with most users preferring to enter spot tonnages for quick shipment. The current market is quiet and automotive tonnage is small.

Strip steel producers at Pittsburgh have fewer orders and are shipping considerably less than in December. Both hot and cold-rolled strip steel bases are firm with 1.75c, Pittsburgh, quoted on hot-rolled and 2.40c, Pittsburgh or Cleveland, on cold-rolled.

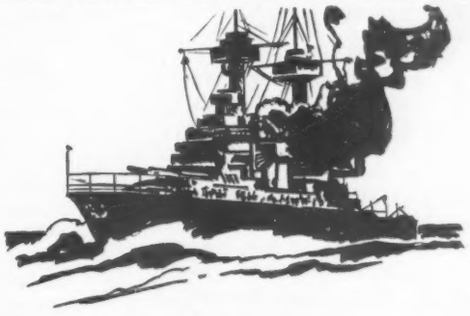
Strip demand is increasing at Chicago, headed by an upturn in automotive needs. Miscellaneous stamping interests also are taking larger lots although much of this betterment may be traced to automotive requirements. First quarter contracting is fairly well advanced, the market continuing 1.85c, Chicago, for hot strip and 2.70c, Pittsburgh-Cleveland, for cold-rolled strip.

Cold-rolled strip demand has slightly improved in New England. Hot strip is also moving better as a number of rerollers who bought heavily last summer have taken in moderate shipments. At 2.60c, Worcester, Mass., cold strip is firm.

One or two steel interests at Cleveland have booked a larger tonnage of finished steel this month than in the comparable period last month. These new orders are mainly for prompt shipment, and cold and hot-rolled strip requirements for the automotive industry make up a substantial portion.

Stocks of strip steel in the East have been considerably reduced as a result of light specifications in recent weeks. Prices are unchanged at 2.73c, New York, for cold-rolled, and 2.08c, New York, for rot-rolled.

**DIAMONDETTE STEEL DECKS FOR UNCLE SAM'S SAILORS**



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# Pig Iron

Pig Iron Prices, Page 34

Expanding foundry operations in some districts have stimulated pig iron sales.

A stack at Toledo, O., has been banked, another unit there continuing active. A merchant producer with headquarters at Cleveland booked 5000 tons during the week, more than double its recent weekly average, mainly orders from automotive manufacturers. Improvement is noted in contracting at Cincinnati, mainly for small tonnages.

January shipments in the Chicago district will be heavier than anticipated. Automotive foundries are increasing their melt, while needs of farm implement manufacturers show moderate but steady improvement, one of the latter operating all eight of its plants.

Pig iron market at Pittsburgh is slow and melters, with heavier inventories of iron than a month ago, are not in the spot market. Prices at Neville Island and in the valley are firm. Demand continues slow in the Buffalo territory, with large consumers out of the market.

Stocks at the Everett, Mass., furnace have been reduced approximately 32,000 tons since last spring, remaining stocks being rather unevenly balanced with a large proportion of low silicon iron. Demand in that district is light.

Sellers at New York and Philadelphia look for little improvement in buying over the next few weeks. Current orders are largely for single carlots.

Revival of demand is noted in Alabama, and shipments are increasing. Three furnaces are making foundry iron, four on basic and one on ferromanganese.

Merchant sales at Toronto, Ont., have improved, with the daily melt increasing.

A fair increase in buying is reported at St. Louis, with sales for the week aggregating close to 6000 tons, all foundry grades, buyers being stove manufacturers, farm implement makers, jobbing foundries and specialty interests.

# Scrap

Scrap Prices, Page 35

**Pittsburgh** — Strength rules the scrap market, with railroad lists bringing out successful bids some $1 a ton over similar December sales. Early last week a district mill was able to purchase a few thousand tons of No. 1 heavy melting steel at $12.50 but brokers since have declined to sell further at this price and have advanced offering prices approximately 50 cents a ton. A Johnstown, Pa., mill was active last week, paying $13.25 for heavy melting steel and over $13 for scrap rails on the Baltimore & Ohio list. Heavy melting steel on the Pennsylvania list brought $14, sold direct to district mill.

**Cleveland** — Prices of several grades of scrap have been advanced 50 cents to $1 here and at Youngstown, O., though sales and shipments are still light.

**Chicago**—Scrap demand is confined to small lots but prices continue strong. Heavy melting steel is unchanged at $10 to $10.50, following small purchases at the latter figure. Railroad material is bringing around $10 on tracks. Scrap is available in slightly larger lots following the recent upturn.

**Boston** — Scrap prices are firm with dealers' buying quotations on several grades higher. Demand is slightly better. Worcester district consumers continues to pay $8 to $8.25, delivered for No. 1 heavy melting steel.

**New York**—Breakable and machinery cast scrap have advanced sharply, $12.50 being paid for the former delivered, Bethlehem, Pa., with $12 for breakable delivered. Other grades are firm with advances on several.

**Philadelphia**—Strength is apparent in the steel and iron scrap market, with No. 1 heavy melting steel nominally higher at $11.50 and other grades advanced. Southern railroad has a large list pending.

**Buffalo**—Scrap prices have firmed up following Bethlehem's purchase of about 10,000 tons of heavy melting steel and other materials. First contracts were made around $10 for No. 1 and $8.50 for No. 2 but only smaller tonnages were available at these levels and prices quickly advanced 50 cents to $1 a ton. Most buying is reported to have taken place at the higher figure.

**Detroit** — Iron and steel scrap prices are steady except for adjustments in a few specialties to bring them in line with the market. Dealers still appraise the market as strong but do not look for advances before early February.

**Cincinnati** — Heavy melting steel and some other grades of scrap are higher, in sympathy with stronger markets in other districts.

**St. Louis**—Iron and steel scrap is scarce and under active dealer competition quotations have advanced. Purchasing is light but there is a substantial volume of inquiry from mills. Yard stocks are considerably smaller than a few months ago and dealers are holding their reserves.

**Birmingham, Ala.**—Steel and iron scrap holds steady as to supply and price, with consumers taking moderate requirements.

**Toronto, Ont.**—Consumers are buying iron and steel scrap for current needs but no future contracts have been placed. Sales are ahead of those at the end of the year. Steel grades are dull but a fair demand exists for iron scrap.

# Iron Ore

Iron Ore Prices, Page 34

**Cleveland**—Shipments of iron ore from Lake Erie furnaces in December, 82,691 tons, exceeded those in December, 1932 by 53,827 tons, according to the Lake Superior Iron Ore association. Receipts at Lake Erie docks and shipments therefrom for the year 1933, and balances on dock Jan. 1, 1934, follow:

| Port | Receipts | Shipments | Dock Bal. Jan. 1,'34 |
|---|---|---|---|
| Buffalo ..... | 1,534,132 | 4,320 | 1,847 |
| Erie ..... | 777,717 | 794,697 | 121,163 |
| Conneaut... | 2,789,133 | 2,578,687 | 1,900,695 |
| Ashtabula.. | 2,066,817 | 1,998,016 | 1,613,919 |
| Fairport..... | 1,087,352 | 1,110,722 | 387,735 |
| Cleveland.. | 4,633,590 | 3,279,914 | 923,097 |
| Lorain ..... | 2,029,469 | 1,257,087 | 12,931 |
| Huron ..... | 514,789 | 486,113 | 352,283 |
| Toledo ..... | 890,051 | 483,722 | 13,004 |
| Total..... | 16,323,050 | 11,993,278 | 5,326,674 |
| Year ago.. | 2,707,548 | 2,507,054 | 5,162,251 |

Receipts for the year at other than Lake Erie docks follow:

| Port | Season |
|---|---|
| Detroit ..... | 554,375 |
| Indiana Harbor ..... | 1,031,096 |
| Gary ..... | 1,369,505 |
| South Chicago ..... | 2,005,798 |
| Hamilton, Ont. ..... | 123,870 |
| Total ..... | 5,084,644 |
| Comparative one year ago..... | 824,759 |

# Coke

Coke Prices, Page 33

Furnace coke inquiries covering first half for blast furnaces of both Pittsburgh Steel Co., Pittsburgh, and New Jersey Zinc Co., Palmerton, Pa., have been closed. Pittsburgh Steel Co. is planning to blow in its Monessen, Pa., stack and movement of coke from the Neville Island plant

of Davison Coke & Iron Co. got under way the middle of last week.

Although the market otherwise is dull, some beehive operators are unable to lay in stock because of hand-to-mouth buying by most users, which makes shipping requests often difficult to fulfill.

Gradual improvement in foundry operations at Chicago is reflected in heavier shipments of by-product coke. While schedules of some plants are relatively light, betterment has been fairly general.

Shipments of by-product foundry coke are fairly steady at Cincinnati with little change from December.

## Warehouse

**Warehouse Prices, Page 36**

Price of cold-finished steel bars out of warehouse in Pittsburgh has not yet been settled. For delivery in Pittsburgh a base of 3.45c on flats, squares, rounds and hexagons likely will be adopted, with 3.35c for outside delivery. The former base had been 3.20c. Clarification of what constitutes a free delivery zone is holding up definite announcement.

Tonnage booked by Cleveland warehouses so far this month exceeds by a slight margin that in the comparable period last month, especially in steel bars and plates. Renewed buying is setting in, following inventories.

Warehouse sales at Chicago are steady with seasonal improvement expected late this month. Inventory taking restricts new buying. Prices are unchanged.

Warehouse business in iron and steel at Detroit holds to the fourth quarter average, which is good. Prices are unchanged.

Warehouse business at Cincinnati is little changed in volume from that of December, with prices steady.

Cold finished steel out of Boston warehouse has advanced to 4.00c for rounds and hexagons and 4.50c for flats and squares. Most jobbers have covered for new supplies for this quarter and are taking some shipments, notably of sheets.

St. Louis jobbers report a moderate gain in activities, better demand for sheets, mainly from stove and furniture interests.

## Bolts and Nuts

**Bolt, Nut, Rivet Prices, Page 33**

The largest rivet order for ship construction to be placed in the East in many months has just been awarded by the New York Shipbuilding Co., Camden, N. J., 600 tons of steel rivets and 120 tons of iron rivets. This contract went to the Pittsburgh Screw & Bolt Corp., New York. The rivets will be used in the construction of two tankers for the Standard Vacuum Transportation Co.

Practically all consumers have signed first quarter contracts for bolts, nuts and rivets, but specifications are light. Considerable bolt and nut tonnage will be released with railroad rolling stock programs.

According to present intent, 70 off list on bolts and nuts will continue through this quarter. The same is true of large rivets at 2.75c, Pittsburgh, and 2.85c, Chicago, and small rivets at 70 and 10 off.

Railroad repair work, car building and farm implement production are relied on at Chicago to give better demand early this year. Automotive needs are tending upward.

Nut and bolt manufacturers at Cleveland say January business will exceed that of December, owing to increase in automotive demand Shipments to automobile builders are expanding and railroad releases also have improved slightly.

## Semifinished Steel

**Semifinished Prices, Page 33**

Possibility of an advance in sheet bars, billets and slabs for second quarter is being discussed and an announcement may be made before Feb. 18. This is the earliest date permissible under the steel code. Currently $26, Pittsburgh, is the base on sheet bars, billets and slabs. Mill activity in wire rods is mainly in building up depleted stocks with little consumer demand at the new $36, Pittsburgh, price.

## Ferroalloys

**Ferroalloy Prices, Page 34**

Ferromanganese specifications are developing rather briskly, as steelmakers prepare for higher operations. The price is unchanged at $85, gross ton, duty paid seaboard. Spiegeleisen also is moving more freely, with spot carlots of domestic material, 19 to 21 per cent, holding at $26 a ton, furnace, the price established late last month.


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# Metals

Nonferrous Metal Prices, Page 51, 53

**New York**—Except for fair sales in lead the nonferrous metal markets were quiet and inactive last week. Prices have held fairly steady though copper and zinc slipped off early in the week. A thorough test of quotations was lacking in practically all of the markets.

COPPER — Continued delay in reaching an accord on the copper code has combined with continued dullness in demand, weakness in the market abroad and larger intakes of scrap to weaken the market. Early in the week metal became freely available at 8.00c, Connecticut, down ¼ cent.

LEAD—Demand for lead has been fairly active the past week. Sellers in general have been satisfied with order books and many of them on several days have booked sufficient business to equal ore intakes. Demand has been well diversified with purchasers supplying the automotive industry the most active. Prices held firm at 3.90c, East St. Louis, and 4.00c, New York.

ZINC—Prime western slipped off last week following easiness in the market the preceding Saturday. Metal was freely available at 4.25c, East St. Louis, all week but following the early week display of easiness the market held steady. A little buying was done but the market continues under the cloud of an unfavorable statistical balance.

TIN—Straits tin held fairly steady all week around 52.00c on spot. A recovery at midweek in London tended to stiffen the market somewhat but buying continued sluggish.

ANTIMONY—Prices were firm in the antimony market all week despite the absence of active demand.

ALUMINUM—The aluminum market continued steady.

## Quicksilver

**New York**—Quicksilver prices are slightly higher on better demand during the past week. Small lots now are $67.50 to $68.50 a virgin flask of 76 pounds, with round lots available down to $67. Offerings are limited.

## Cold Finished

Cold Finished Prices, Page 33

**Pittsburgh**—Advanced prices on cold-finished steel bars, based on 2.10c, Pittsburgh, have not been adequately tested by the light volume of specifications in the current market. Most jobbers are well stocked and may be counted out of the market for some time, but automobile manufacturers and automotive parts makers soon will buy more tonnage.

# Equipment

While activity in mill equipment continues at a slow rate, broken occasionally by a decision to close on some pending project, machine tool sales are holding in fair volume, backed by good buying on the part of the government.

An allotment of $2,309,491 to the army ordnance department for the purchase of machine tool equipment to modernize various ordnance establishments has been announced by the PWA. Fifteen government arsenals will receive new equipment.

Bids close Jan. 16 on a large list of machine tool items for navy department machine shops.

Chicago reports seasonal factors still retarding development of a marked upturn in demand for equipment, although prospects are regarded favorable. Lakeside Bridge & Steel Co. booked two 10-ton hammerhead cranes for the Mare Island, Calif., bureau of yards and docks, at $44,454.

Release of equipment changes already ordered by subsidiary plants of the United States Steel Corp. at Pittsburgh, would enliven a sluggish market there considerably. Much of this work is in proposed open-hearth changes. Standard Steel Car Corp., Butler, Pa., has appropriated $200,000 for new equipment to produce forgings and other car parts.

Heald Machine Co., Worcester, Mass., during the week of Jan. 29 will have a working exhibit of new equipment, the result of several years' engineering research in the grinding machinery field, including the company's new centerless internal grinding machine.

Buick is reported to be inquiring for a fair list of machine tools at Detroit.

# Tin Plate

Tin Plate Prices, Page 32

**Pittsburgh**—Tin plate hot-mill operations eased off again last week and at 40 per cent had lost 5 points from the week preceding. A leading interest, maintaining a 50 per cent rate, has received some 1934 releases from an important canmaker. Tin plate is firm at $5.25, Pittsburgh.

# Here and There In Industry

Joseph T. Ryerson & Son Inc., Chicago, operating steel service plants in ten principal industrial centers, has been appointed by Inland Steel Co., Chicago, as exclusive sales agent for steel sheet piling in Ohio, West Virginia, Pennsylvania, New York, New Jersey, Maryland, Delaware, New England, Kentucky and the District of Columbia.

□ □ □

Acme Machine Products Co., Muncie, Ind., has bought the Durham Corp., also of Muncie, manufacturer of automotive replacement parts.

□ □ □

S. K. F. Industries Inc. has moved its general and executive offices from 40 East Thirty-fourth street, New York, to Front street and Erie avenue, Philadelphia.

□ □ □

Youngstown Sheet & Tube Co., Youngstown, O., has moved its New York offices from 30 Church street to the forty-seventh floor, 500 Fifth avenue. L. E. Wallace is district manager.

□ □ □

Reading Co. and Central Railroad of New Jersey have consolidated their purchasing departments in the offices of the former at Phiadelphia. J. D. Landis, of the Reading, will be in charge.

□ □ □

Dean Forging Co., Muncie, Ind., has been bought by M. H. Broderick and will be continued in operation on production of drop forgings. Wilbur Full, president of the Dean company, will be in charge as manager.

□ □ □

Paper & Textile Machinery Co., Sandusky, O., has changed its name to Sandusky Foundry & Machine Co., the style under which it began business in 1904. The change is made because the old, now new, name more accurately suggests the nature of its products and facilities.

□ □ □

Trube Co., 101 Park avenue, New York, has been established by Conrad Trubenbach, long associated with the Max Ams Machine Co., New York as treasurer and sales manager. The company will furnish engineering service and supply canmaking and sheet metalworking machinery.

# Pacific Coast

**Pacific Coast Prices, Page 33, 34, 36**

**San Francisco**—(*By Air Mail*)—Awards of plates, shapes, reinforcing steel bars and cast iron pipe for the first week of the year aggregated over 4000 tons, compared with 1500 tons for the first week in 1933. The outlook for first half is bright, as over 218,000 tons are required in projects scheduled to be released for figures before July 1.

Bookings of reinforcing bars during 1933 involved the largest tonnage since 1929 when 83,665 tons were placed. As indicated last week, structural shape lettings were the largest in the history of the Pacific Coast and exceeded by more than 70,000 tons the former record set in 1929 of 188,401 tons. Plate awards were the smallest since 1924 when 47,685 tons were reported. Not since 1922 when 39,132 tons of cast iron pipe were booked have awards been less than for 1933. The following is a summary;

| | Tons 1933 | Tons 1932 | Average 12 Years |
|---|---|---|---|
| Concrete Bars .... | 79,356 | 55,340 | 59,743 |
| Plates ..... | 53,808 | 76,969 | 100,746 |
| Structurals ..... | 259,210 | 188,146 | 140.974 |
| Cast Iron Pipe.... | 40,933 | 43,960 | 70,029 |

Bids were opened Jan. 10 for 25,000 to 40,000 tons of rails for the Southern Pacific Co. Bids for 13,000 tons of fastenings will come up later.

Concrete bar awards during the week aggregated 2156 tons. Pacific Coast Steel Corp. took 650 tons for mooring at Pearl Harbor, T. H. Inland Steel Co., booked 394 tons for Boulder Dam and W. S. Wetenhall Co. 355 tons for an extension to pier No. 1 at Fort Mason, Calif.

The Charleston, S. C., navy yard is to build two coast guard cutters for Pacific waters involving 1000 tons of plates and shapes. Industrial Piping & Engineering Co., Baltimore, was awarded 250 tons for fuel oil tanks at Pearl Harbor, T. H. Western Pipe & Steel Co. is low on 110 tons for a 24-inch welded pipe line for Inglewood, Calif.

The largest structural award of the week went to the Ingalls Iron Works Co., Birmingham, Ala., 315 tons for the superstructure of Pier No. 1, Fort Mason, Calif. Lakeside Bridge & Steel Co. took 200 tons for two 10-ton hammerhead cranes for Mare Island, Calif. McClintic-Marshall Corp. secured 110 tons for the city hall at Signal Hill, Calif.

Pacific States Cast Iron Pipe Co., booked 100 tons of 4-inch pipe for Hanford, Calif., and American Cast Iron Pipe Co. took 145 tons for Napa, Calif. It is understood work will start at once on the new Hetch Hetchy work on which bonds were voted in November as the government has granted over $12,000,000 for the project. About 17,000 tons of cast iron pipe and an equal amount of welded steel pipe will be needed.

## Northwest Prospects Good

**Seattle**—Pending steel tonnages in the Pacific Northwest are heavy although awards in the past week were not large.

Johnson Bros., Seattle, were low at $878,305 for the Ambursen side dam of the Bonneville project, taking 2300 tons of reinforcing material. Washington state has opened bids for the Fourth avenue crossing, Seattle, inquiring 200 tons reinforcing and 900 tons of shapes.

Awards included 150 tons of cast iron pipe, American Cast Iron Pipe Co., Birmingham, Ala., taking 100 tons of 4 and 6-inch monocast for Tumwater, Wash., and United States Pipe & Foundry Co., Seattle, 50 tons of 8-inch for Poulsbo, Wash. Steacy-Schmidt Mfg. Co., York, Pa., has the contract at $30,000 for furnishing machinery for opening and closing the Lake Washington, Seattle, canal locks.

# Steel in Europe

**Foreign Steel Prices, Page 36**

**London**—(*By Cable*)—The market position of iron and steel is promising and production is increasing. Pig iron prices are firm and contracting is being done into second quarter. Producers of steel billets are unable to cope with present demand. Finished steel is gaining considerable impetus. Trade in galvanized sheets is sluggish and tin plate is experiencing increasing competition in foreign markets.

The Continent reports business being resumed slowly after the holidays. An order for 36,000 tons of steel products for Russia is reported placed in Poland.


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# Construction and Enterprise

## New England

WORCESTER, MASS.—C. Stewart & Son Inc. has been incorporated with 1000 shares no par value to manufacture machinery, by Charles M. Stewart, Worcester, Mass., and associates.

## New York

BUFFALO—New York state public service commission has approved plans for the elimination of the South Ogden street grade crossing in Buffalo and similar work in the adjacent village of Sloan, N. Y.

NEW YORK—Atlas Screw & Specialty Co. Inc. has been incorporated to manufacture hardware products, with 10 shares preferred and 50 shares no par value, by Price Bros., 11 West Forty-second street, New York.

## Pennsylvania

CHRISTY PARK, PA.—Contract had been awarded to P-K Construction Co., 207 Fulton building, Pittsburgh, by department of highways, Harrisburg, Pa., for construction of a boiler house and blacksmith shop addition to cost $7300.

PITTSBURGH—Standard Steel Car Corp., Butler, Pa., subsidiary of the Pullman Car & Mfg. Corp., Chicago, has announced intended expenditure of $200,000 for new equipment at its Butler plant for the manufacture of steel forgings and other car parts.

READING, PA.—Reading Steel Products Inc. has been incorporated with $100,000 capital to fabricate structural steel and ornamental iron, by A. W. and D. B. Benham and A. E. Rabold.

## Ohio

TOLEDO, O.—Port commission of Toledo is planning construction of a $1,500,000 harbor terminal on the west side of the Maumee river at Wheeling avenue.

## Michigan

DETROIT—Metro-Metal Mfg. Co., 1326 East Woodbridge, has been incorporated to manufacture steel products, with 400 shares no par value, by A. W. Schostak, 3311 West Chicago boulevard.

IONIA, MICH.—City plans erection of a school building to cost $250,000, partly financed by CWA funds.

NILES, MICH.—Williams Bros., Niles, have been awarded the contract for remodeling present buildings and construction of a brewhouse in Niles for the Four Flags Brewing Co., K. T. Newhouse, Chicago, is architect.

MELVINDALE, MICH.—Bennett & Straight, architects, Dearborn, Mich., have been retained to prepare plans for a $60,000 school building for the board of education.

## Indiana

CONNERSVILLE, IND.—National Metal Products Co. Inc., East Tenth street, has been incorporated with $15,000 capital to manufacture casket hardware and other steel ornamental products, by Benjamin F. Johnson, Cambridge City, Ind., F. H. Thompson, Losantville, Ind., and associates.

INDIANAPOLIS—American Automotive Corp. has been formed to acquire a portion of the plant, equipment and inventory of the Marmon Motor Car Co. with the view of resuming production of Marmon cars and the motor products of Harry A. Miller, Los Angeles. A. D. Sterner, S. N. Wheeler and Preston Tucker, the latter formerly sales manager of the Pierce-Arrow Co., Detroit, head the company.

MUNCIE, IND.—Muncie Gear Works Inc. has been incorporated with 999 shares no par value to manufacture machinery, tools and novelties, by Kenneth A. Spurgeon and associates.

## Illinois

CHICAGO—Apex Mfg. Co., 2815 Irving Park boulevard, has been incorporated with 100 shares no par value to manufacture metal spring covers and other automotive accessories, by Fred A. Schlesser, 2815 Irving Park boulevard, Chicago.

CHICAGO—Hayes Emulsor Co., 8 South Michigan avenue, has been incorporated with 100 shares par value and 500 shares no par value, to manufacture emulsifying and pasteurizing systems and appliances, by Frank H. T. Potter, One LaSalle Street building, Chicago.

## Missouri

KANSAS CITY, MO.—Engineer Missouri river division United States army, 707 Postal Telegraph building, Kansas City, Mo., will receive bids until Feb. 3 for 160 cast steel ball joints for 28-inch pipe line suction dredge unit and 1560 pieces flanged steel pipe for the same unit.

ST. LOUIS—F. M. Roehlk Spring Co., F. M. Roehlk president, has bought the assets of the South Side Spring Co. and has enlarged its own plant at 1428 Clark street to accommodate additional machinery and equipment of the latter.

## Oklahoma

HARTSHORNE, OKLA.—A. & P. Coal Co. has been incorporated with $2000 capital to operate coal mines, by Frank Passini, president.

TONKAWA, OKLA.—A. H. Love, 207 South Seventh street, has enlarged his machine shop to 30 x 60 feet and will install an additional lathe, shaper and milling machine.

TONKAWA, OKLA.—U. & I. Boiler & Machine Works, Robert Nelson, manager, has moved its shop and office to a new building at 215 South Main street where a larger machine shop is available for the manufacture of oilfield tools.

TULSA, OKLA.—Sands & Warehan Welding & Ornamental Iron Works has leased space at 220 South Frankfort street for shop and office. B. C. Sands is manager.

TULSA, OKLA.—Electric Machinery Co., specializing in repair of electric motors and pumps, has leased a building 40 x 100 feet at Second and Detroit streets for shop purposes. D. R. Jarrett and Roy Harp are owners.

## Texas

BAIRD, TEX.—Baird Refining Co. has been incorporated with $25,000 capital to operate an oil refinery, by D. C. Biggers.

PLAINVIEW, TEX.—Plainview Refining Co. has been incorporated with $40,000 capital to build and operate an oil refinery, by J. C. Hooper, president.

SAN ANTONIO, TEX.—Oil Field Equipment Co. has been incorporated to manufacture and distribute oilfield supplies, by Ben Cothensky, Okmulgee, Okla.

## Wisconsin

HORICON, WIS.—Van Brunt Mfg. Co., manufacturer of grain drills and seeding machines, has resumed operations with 150 on the payroll after being idle three years.

OSHKOSH, WIS.—United States Motor Corp., Oshkosh, has been given a government order at $100,000 for 300 motor-generator sets for CCC camps.

STOUGHTON, WIS.—City has voted to ask a federal loan of $121,000 for installation of a standby unit for the municipal light and power plant.

TWO RIVERS, WIS.—City has been allotted $143,000 for construction of a water filtration plant. E. J. Donnelly is city manager.

## Pacific Coast

COOS BAY, OREG.—Plans for an airport costing $80,000 have been approved, part of cost to be advanced by CWA.

MABTON, WASH.—State funds to the extent of $12,000 have been allotted to the city to aid in construction of a $50,000 water supply system.

SEATTLE—Pacific Union Mines Corp. has been incorporated with $50,000 capital by A. L. Smith and associates, 925 Green building, Seattle.

SEATTLE—Western Brewing Co., Dexter Horton building, has bought 2½ acres on East Marginal way, Seattle, for construction of a $250,000 brewing plant. R. C. Rising, Seattle, is architect.